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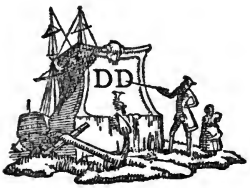
WHO PAYS?

Who Pays?

By ERNEST GREENWOOD

Author of: ALADDIN, U. S. A.;
PROMETHEUS, U. S. A.; AMBER TO AMPERES;
EDISON: THE BOY—THE MAN; THE GREAT DELUSION;
MODERN ELECTRICITY IN THE AMERICAN HOME;
THE AMPLIFIER STORIES, ETC.



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FIRST EDITION

To
L. M. G.

Author's Note

FOR a score of years large industrial corporations, chambers of commerce, the National Safety Council, the great insurance companies, parent-teachers' associations, a variety of civic organizations and public-spirited individuals have been spending, in the aggregate, millions of dollars annually in an effort to stem the rising tide of death and disaster due to preventable and unnecessary accidents—and fires.

Yet the American people have remained strangely apathetic. Our public-school system, for which we spend billions each year, is still spotted, here and there, with superintendents and boards of education apparently ignorant of the new problems created by the increasing complexities of our daily lives and obsessed with the idea that the only function of the public school is to teach the three R's. In too many American communities there seems to be a growing public sentiment—particularly since the depression—among business men and other taxpayers that some of the so-called extra-curricular material in the schools be eliminated and that they return to these same three R's as a basis for their educational efforts.

We still have with us thousands of employers who persist in the idea that personal injury accidents within their establishments concern only the employee involved and his family—their only response to the suggestion of a planned safety program is to complain of the cost of compulsory workmen's compensation insurance. Our streets and highways are choked with millions of motor vehicles of all descriptions, yet many states are criminally lax in the granting of drivers' licenses while enforcement of traffic laws, rules, and regulations by police and the courts is notoriously lacking in many others. The superstition "safe at home" is accepted by intelligent people everywhere, yet the home itself is second only to the motor vehicle as a producer of fatal and non-fatal personal injury accidents. Meanwhile, the grim reaper smiles in his sleeve as he takes his daily toll from humanity's stupidity and carelessness.

Yet the so-called "organized safety movement"—the effort to teach men, women, and children to use the tools, conveniences, devices, and equipment of modern civilization properly—has little to do with that much misunderstood slogan, "Safety First," as it is frequently interpreted today. God forbid. Taken *literally* this slogan is an open invitation to habitual cowardice. As Mr. Albert W. Whitney, Associate General Manager of the National Bureau of Casualty & Surety Underwriters and vice

president in charge of Safety Education of the National Safety Council,[1] says in his charming booklet *Safety for More and Better Adventures:*

It is an appropriate sentiment in the railroad field for safety on trains is more desirable than speed, barbers, stock reports or ladies' maids. But to carry the slogan into the public schools is positively immoral because if taken literally and seriously it means that safety is to be counted as the prime desideratum of life.

Elaborating this idea he quotes Mr. Dwight Marvin as saying:

" 'Safety First' is a direct challenge to every act of heroism the race has witnessed. It would elaborate to a virtue the mean, the obsequious, the calculating, the flattering; and it would condemn the man who holds duty above comfort and principle above pleasure.

"All progress comes through desperate chances. The physician inoculates himself with a deadly disease and watches to see whether his specific will work or whether he will die. The explorer goes over the hills or across the sea to an unknown country, never knowing whether he will come back or will give humanity a new outlook. A Lindbergh rides the skies alone to prove, at terrific risk, that an air-

[1]The National Safety Council, a leading organization in accident prevention and safety education, has never officially endorsed the slogan "Safety First."

plane can cross the Atlantic in safety. A dreaming maid sacrifices her quiet home in Domremy to play her life at high stakes for her king, and she saves France, riding into history with the valor of a perfect knight. A Teacher risks and wins a felon's death because He prefers to give His life for His friends rather than save it for himself. It was He who said: 'He that would save his life shall lose it.' And history avers that he was utterly right."

This is all quite true—the phrase is a dangerous one to use in connection with the organized effort to teach children, young folks, and even their fathers and mothers, the principles of safety and the best means to avoid unnecessary accidents. But it must not be forgotten that the early pioneers in the movement to introduce safety measures into industry and transportation —the Judge Garys, the Father Coffins, the Dublins, the Richards, the Palmers, and a host of others—meant something quite different when they adopted the slogan "Safety First." What they really had in mind was the principle that "safety shall be the first consideration," meaning that it must take precedence over speed in production, costs, or any other factor that enters into the intricate processes of manufacturing and transportation. As Judge Gary said in his appeal to the Board of Directors of the U. S. Steel Corporation for the adoption of organized safety within its many plants: "You

perhaps do not realize the importance of this matter as fully as we who have given it our closest consideration. But, gentlemen, it is the *right* thing to do. If you will back us up in it, we'll make it *pay.*" Why it was the right thing to do and how it paid will be shown in a later chapter.

But because I thoroughly agree with the present-day criticism of the manner in which the phrase "Safety First" is being used in certain activities, this book will not be a preachment of the doctrine that "safety is to be counted as the prime desideratum of life." While presenting the high lights of the appalling and, in the majority of cases, senseless loss of life, limb, and property due to preventable accidents and fires it will preach, if it preaches at all, a doctrine of "safety for," as well as "safety from." As Mr. Whitney says, "Danger cannot be taken out of life without leaving it as flat and uninteresting as a golf course from which the hazards and bunkers have been removed, leaving it too easy to be worth playing."

Where is the normal, healthy, intelligent boy who does not like to shoot a rifle, sail a boat, swim, play baseball or football, hike through the woods, go camping, or do any of the innumerable things which have been associated with healthy, normal boyhood since time immemorial? Danger? Of course there is danger accompanying every activity of normal child-

hood, but there is also danger in walking downstairs, crossing a street, or operating any of the innumerable gadgets designed to make the operation of the home less laborious. Given an intelligent boy, he can be taught to do all of these things with the element of danger reduced to a minimum. Eliminate carelessness, and 99 per cent of the danger no longer exists.

How often does one find a normal boy or girl passing into manhood or womanhood who does not like to drive an automobile? If they are intelligent, they can be taught to drive with safety to themselves and others; if they are not intelligent, then they ought not to be allowed to use any of these facilities which man has made for his comfort, convenience, and pleasure. Every normal man and woman likes to ride in an airplane or a speed boat, go on a hunting expedition, cross the ocean, or even ride in a trolley car, but there is always some element of danger in everything we do, even though we confine our lives to a cyclone cellar or to a tent far from civilization. Lives have been lost and property destroyed by the striking of a match; legs have been broken by tripping over a croquet wicket; golf balls have fractured skulls, and people have died of pneumonia due to a neglected cold.

Danger?

Danger is woven into the very warp and woof of life. Danger cannot be taken out of life. . . . It

is the daring, high-souled, vigorous man and woman with the courage to face and experience the world that have survived and left descendants. Our blood is full of the urge of it, and it is unlikely that civilization will be able to divert the stream of life into tamer and more ignoble channels.

But the doctrine "safety for" evaluates life—it recognizes and distinguishes between the good values and the poor values. It gives us the chance to select the values we most prefer, for if we are not safe we cannot select, and must take what chance and *carelessness* may have waiting for us, around the corner, in the form of an accident. Accidents break into our purposes; they interfere with something we are doing or that we should like to do. By derivation the word "accident" means "falling across"—that is, falling across some order or purpose. Combining these ideas, "safety" may be said to be the condition that makes it possible to lead a "purposeful life of good adventure." Approximately one hundred thousand men, women, and children were gathered to their fathers in 1933 by this "falling across" of their purposes by accidents and fires while nearly eight and a half million had their activities interrupted by non-fatal accidents of which a very large number resulted in permanent injury and complete disability.

This, then, is my apologia for this book. If, at times, I seem to run rather heavily to statistics, it is because it is only by means of

figures and their comparison with other figures more familiar to us in our everyday activities that the true picture of one of our besetting national sins, carelessness, can be drawn. For such folks as insurance company officials, leaders of safety movements and campaigns, heads of police or fire departments, it has little to offer that is new. To them its virtue, if it has any, lies in the fact that it brings together, under one cover, the more important and striking features of a vast amount of interesting material gathered together by a great army of valiant workers in the field of life conservation. To those of these who, recognizing their material, are tempted to accuse me of plagiarism I can only reply with the remark made by some philosopher who said: "When an author steals one man's stuff it is plagiarism—when he steals the stuff of many it is research."

If the book causes mothers and fathers who are not familiar with the situation to pause and ask themselves whether or not they are doing their part in the effort to eliminate some of this tremendous waste of life, economic values, and human suffering, the writing of it will have been quite worth while.

E. G.

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Part I
Who Pays?

CHAPTER I

The Picture

SINCE the Declaration of Independence these United States have engaged in six major wars as a nation: the Revolutionary War, the War of 1812, the Mexican War, the Civil War, the Spanish-American War, and the World War. The actual duration of these wars (in so far as we were engaged in them) added together was approximately fifteen years. Less than 300,000 American men were killed in action or died of wounds.

During the past fifteen years of peace times 1,300,000 men, women, and children have been killed in the United States by accidents, and countless millions have been injured, many of them permanently disabled! To this ghastly total must be added between 100,000 and 150,000 burned to death in fires which, in a majority of cases, were due to rank carelessness.

We look back upon the World War as a great national catastrophe and mourn our dead: 50,510 members of the American Expeditionary Force were killed in action or died of wounds

in eighteen months. During the eighteen months ending December 31, 1931, motor vehicles alone killed 53,650 people![1]

We look back upon the World War as a great economic loss because its direct cost to the American taxpayer is estimated at $25,000,000,000. Yet the direct economic loss due to accidents of all kinds in the United States each year —and it can be proven—is approximately $10,000,000,000.[2] To this must be added a direct loss of nearly $500,000,000 due to accidental fires.

What is $10,000,000,000, anyhow?

It is a sum so vast that the average individual has no conception of it. Even the capitalist, whose income may run into seven figures, or the international banker experienced in the financing of whole nations, can deal with it only as a symbol in the intricate mathematical equations of national or world finance. Yet $10,000,000,000 is the minimum total of the bill handed to the American people each year by old Doc Carelessness, a creditor who must be paid on the dot and who forecloses on 100,000 lives annually.

[1]The question may be asked, "Why does the author pick out the eighteen months ending December 31, 1931, instead of the eighteen month ending December 31, 1932, or June 30, 1934?" Automobile accidents steadily increased until they reached their peak in 1931. As the depression increased in intensity, the use of motor vehicles decreased, and the accident rate dropped. Already the accident rate has resumed its upward trend.

[2]For an analysis showing how the figure of $10,000,000,000 is arrived at, see Appendix A.

Ten billion dollars a year would support 4,000,000 families of five persons each or 20,000,000 individuals in comfort. It would feed 50,000,000 and feed them well. It is nearly five times as much money as we spend each year on the education of the 28,000,000 children in our public schools. It would reproduce the 250,000 buildings in our school system (valued at $6,000,000,000) and leave $4,000,000,000 a year or twice as much as we are now spending to operate our school system. It would buy (on a basis for the assessed value for taxation purposes) all of the states of Maine, New Hampshire, Vermont, Florida, Tennessee, Alabama, Mississippi, Arkansas, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Washington, Oregon, Nevada, North Dakota, South Dakota, New Jersey, Rhode Island, Connecticut, Massachusetts, Wisconsin, Minnesota, Iowa, Oklahoma, Missouri, and Nebraska, all thrown together in one great big pot. It would buy all the homes, public buildings, schools, theaters, stores, office buildings, electric light, gas, and water systems, street car lines, taxicabs, trucks, buses, and private automobiles, including the contents of all stores and warehouses of a city of a population of 1,250,000, such as Los Angeles. With $10,000,000,000 one could buy out John D. Rockefeller and son John, Andrew Mellon, Henry Ford, and a host of lesser lights between breakfast and dinner time and still have

enough left to live in comfort for the rest of one's life.

This is the direct loss—the loss that can be estimated in dollars and cents. What economist can calculate the value to society of the 100,000 persons killed by accidents and fires each year, or the 330,000 permanently disabled?—the men, women, and children of a city with nearly half a million population wiped out of the general scheme of things annually by processes which the smug like to designate as "unavoidable" or "acts of God" but which, for the most part, could be avoided, for accidents do not happen —*they are caused.*

What is a child's life worth? It is worth a lot to the youngster's parents, but to the individual whose job it is to keep the mortality tables up to date it is just a statistic. In 1932, 13,354 children under 10 years of age met what were called "accidental deaths." More than 9,000 boys and girls between 10 and 20 years of age followed the same road: nearly 23,000 youngsters killed for apparently no reason at all except our devotion to carelessness and our failure to appraise the value of life until death steps into our own homes, and then it is too late—values are no longer of any importance.

What statistician will attempt to evaluate the intangible losses due to the temporary withdrawing from circulation of some 8,730,000 persons because of non-fatal personal injury ac-

cidents? When we bring these intangibles into the picture—the value of the lives lost and the values destroyed in countless other ways by accidents—we become hopelessly bogged down in a swamp of figures which, to the nonmathematical mind, are more incomprehensible than the Einstein Theory of Relativity.

A great catastrope—a hurricane, earthquake, school or theater fire, railroad wreck, or even an airplane crash involving the death of comparatively few people—fills the front pages of our newspapers for days. There are accusations and counter accusations; investigations by half a dozen public and private agencies; sermons, interviews, and editorials; until finally the story begins to wear itself out and gives way to the latest political scandal or the marital tangles of someone prominent socially or otherwise. But the story of our national waste due to avoidable accidents and fires is fortunate if it occasionally receives a paragraph or two somewhere near the classified advertising section. Unfortunately it has to be told statistically, and the American people, as a whole, have a congenial dislike for statistics. Furthermore, the accident rate has grown so gradually, and the sum total of accidents themselves is distributed over so large an area that we accept them as a part of modern life, and they fail to command public attention for any length of time.

From the standpoint of numerical "produc-

tivity" the sources of accidents, listed in this order are: The automobile; the home; public accidents other than those caused by motor vehicles; industry; fires; the railroads; street cars; airplanes. From the headline writer's point of view, the theater or school fire and the passenger airplane crash are the most important. The railroad wreck (probably because it is so infrequent) is a close second when it comes to newspaper publicity. Accidents in and about the home, which produce almost as many fatalities as the motor vehicle and four times as many non-fatal personal injury accidents, receive scant attention, rarely being recorded anywhere except in the local paper and insurance company mortality tables. Public accidents, if they involve any considerable number of people, such as the caving in of a grand stand or the blowing over of a circus tent, receive some attention at the hands and typewriters of editors —otherwise they are not news unless there has been displayed something unusual in the way of heroism or unless there is something unique about them.

But the accident situation as a whole—that great design of life and death which is woven through the fabric of our everyday lives—seems to be too vast for public comprehension, or else it has become too commonplace to be classified as front-page or editorial news. It is accepted as a fact that just about so many men, women, and

children must be killed or maimed each day by accident and that very little can be done about it. Like taxes, or death from old age or disease, it is something that is always with us, and "Stop, Look, and Listen" admonitions no longer find any customers. The American people are fatalists and consider carelessness as a heritage which has come down to mankind from Adam with no one to blame but our first ancestor and an inscrutable Providence.

This attitude might be all very well if accidents involved no one but the person or persons who are careless. If a man is alone in his automobile and drives head-on into the side of a train (25 per cent of the motor-vehicle accidents occurring at grade crossings are the result of automobiles hitting trains, and not of trains hitting automobiles), it is his own funeral if he himself crashes through St. Peter's gates. But when the driver of a school bus violates the law requiring him to stop at a railroad crossing before crossing the tracks and causes the death of a dozen or more young children, it is quite another story. To the most conservative he is guilty of manslaughter, and if he escapes himself should be treated accordingly. Even if he succeeds in getting across the tracks without an accident he should be charged with reckless driving.

Less than ten years ago Mr. Hoover, then Secretary of Commerce, called together repre-

sentatives of various great national organizations such as those representing the railroads, the street railways, the automotive industry, the insurance interests, general business as represented by the Chamber of Commerce of the United States, and the National Safety Council representing the organized safety and accident prevention movement. His attention had been called to the tremendous human and economic loss due to street and highway accidents, and he was convinced there was a problem to be solved which fitted very well into his "Elimination of Waste" program. He believed that some cooperative effort on the part of all the interests involved would result in a steady reduction of the motor-vehicle accident rate.

A permanent "National Conference on Street & Highway Safety" was organized, with headquarters in the U. S. Department of Commerce, a permanent staff, a variety of permanent committees and an annual national convention of representatives of city and state governments, railroads, street railways, automobile manufacturers, automobile dealers and owners organizations, taxicab and bus interests, commercial enterprises operating fleets of trucks, insurance companies, educational institutions, and various other public and private activities.[3] The Conference accomplished a great deal, pointing the

[3]See "The National Conference on Street and Highway Safety," Appendix B.

way to a number of reforms and suggesting many worthy projects which might contribute to a reduction of the accident rate. But—the motor vehicle accident rate was not reduced. Ten years ago automobiles were killing 18,000 persons each year and injuring some 650,000 more. By the end of 1928 the fatalities had increased to 28,000 annually, reaching a peak of 33,675 by the end of 1931. In 1932 the number of fatalities dropped to 29,500, due, possibly, to the depression and a decreased use of the automobile. In 1933 the upward trend started again that year, having a total of 31,000 motor-vehicle fatalities. During the past five years the automobile has killed nearly 160,000 persons and injured some 5,000,000 more. On this basis the decade 1930–40 will produce about 315,000 motor-vehicle fatalities and approximately 10,000,000 non-fatal personal injury accidents. It is, and probably will remain, the principal problem in the field of accident prevention.

A comparison of motor-vehicle fatalities with population is interesting. From 1913 to 1932 the population of the United States increased about 30 per cent. In 1913 there were 4.4 persons killed by automobiles per 100,000 of population. By 1931 this number had increased to 27.1 per 100,000 of population. In 1932 the number dropped to 23.6 per 100,000 but in 1933 it increased to 24.7 per 100,000.

But, says the reader, look how the total num-

ber of automobiles has increased during that time. Quite true, and using this total as an index we find that while in 1913 there were 306.7 fatalities for every 100,000 cars in use, in 1932 there were only 121.6 such fatalities. But, if we are considering the motor vehicle as a producer of fatal and non-fatal personal injury accidents, the fact remains that the motor-vehicle death rate has increased 5 or 6 times during the past ten years.

Strange as it may seem, the home is quite as dangerous a spot as the streets and highways. A glance at the figures impresses one with the idea that it is no more dangerous to sit down in the middle of some street such as Fifth Avenue, New York, Michigan Avenue, Chicago, or Market Street, San Francisco, than it is to stick around the house.[4] The home was responsible for 29,500 fatal accidents last year and for more than 4,000,000 personal injuries which did not result in death, although many of them did result in permanent disability. This sounds almost too silly to be true, but it is—as the records of the insurance companies prove. Burns, scalds, and explosions among children and falls among older people are the outstanding types of these accidents.

If a man in normal health crawls up a shaky

[4]It must be noted, however, that "exposure" in the home, that is the number of people multiplied by the number of homes, is much greater than the exposure on the streets.

and unsafe ladder inside or outside his home, falls, and breaks an arm or a leg, he is not deserving of a great deal of sympathy—at least, not any more than the insurance company which has to pay the bills caused by his carelessness. But when he leaves an electric-light wire lying on the floor for a baby to chew, thereby paving the way to fatal burns (there has been more than one fatal accident caused in this way), he is guilty of a form of criminal negligence for which there is not the slightest excuse. If a mother burns herself, it may or may not be her own fault, but it is certainly her fault if she leaves a kettle of boiling water where a young child can pull it over and be scalded to death. The National Safety Council tells us that 37 per cent of the fatal accidents to children under 4 years old in the home are due to scalds, burns, and explosions while 35 per cent of those occurring to children between 5 and 14 years of age are due to the same cause.

Until the coming of the motor vehicle "accidents" and the "accident rate" suggested immediately the wheels of industry turning out the infinite variety of commodities which seems to be necessary to our health, comfort, and happiness, or the wheels of transportation carrying these same commodities and humans here and there. Accidents meant mechanism, and accident-prevention programs meant methods of

guarding the machinery so workmen could not injure themselves.

Thanks to the insurance companies, the organized safety movement, and the hearty coöperation of most of business and industry itself, the

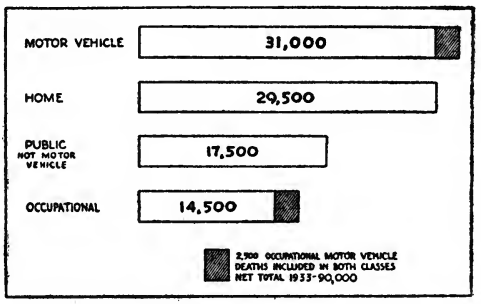


Figure 1. Four Principal Classes of Accidental Deaths, 1933. (See Section 3.)

Source: National Safety Council estimates, based on U. S. Census Bureau data.

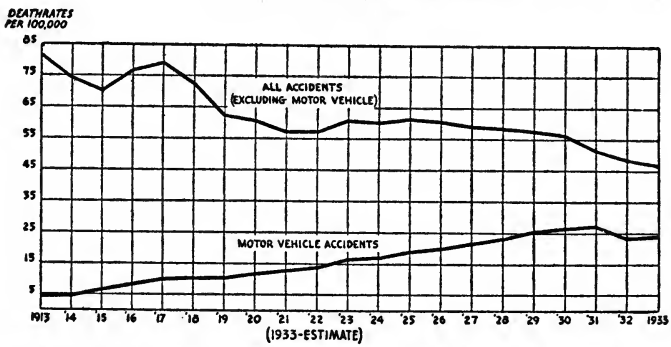


Figure 2. Motor Vehicle and Other Accident Death Rates, 1913-1933. (See Section 7.) Source: U. S. Census Bureau data.

trend of "accidental occupational deaths," as fatal accidents which accompany human occupations are called, has an encouraging record. Approximately 14,500 persons were killed by accident in the United States during 1933 while in the course of gainful employment—that is,

while working for a living. This compares most favorably with 15,000 in 1932; 17,500 in 1931; 19,000 in 1930; 20,000 in 1929; and 19,000 in 1928.[5]

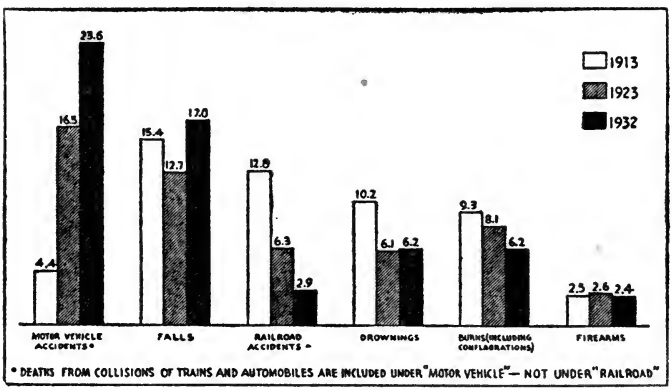


Figure 3. Death Rates for Principal Types of Accidents, 1913, 1923 and 1932. (See Section 7.) Source: U. S. Census Bureau data.

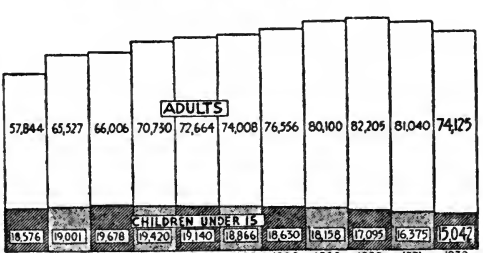


Figure 4. Total Accidental Deaths of Children and Adults, 1922-1932. (See Section 8.)

Source: Calculated from U. S. Census Bureau data.

[5]Accidents to men at work have commonly been spoken of as "industrial" accidents. Many persons, however, interpret the term "industrial" as meaning only manufacturing or, perhaps, only large-scale enterprises. The word "occupational," therefore, has been adopted to indicate more clearly that the classification includes all accidents arising out of and in the course of gainful employment. This includes all employees or self-employed persons in manufacturing, mining, agriculture, transportation, trade, and all other gainful occupations.

In other words, "occupational hazards" in 1933 killed less than one half the number of persons killed by the automobile and less than one half the number killed by hazards met with in the home. It might seem, from this fact, that a man is twice as safe when he is at work as when he is at home. This, of course, is not true.[6] Industry has taken to heart the admonition that "production without safety is inefficient," and the low death and accident rate is due to the splendid accident prevention work carried on by large corporations inspired and guided by the engineering and inspection departments of the large insurance companies and the National Safety Council. It has been found that these "industrial" or "occupational" accidents *can* be prevented and that accident prevention work pays cash dividends.

The most spectacular cause of death and disaster by accident is fire. Everything about a fire, from the first alarm to the return of fire-fighting apparatus from a successful battle with the flames, is dramatic. As we will see in a future chapter, fire is Nature's great paradox—at one and the same time a creator, a preserver, and a destroyer. It has been an object of superstition and veneration since the days of primi-

[6]As a matter of fact, the question of "exposure" must be considered as a factor in a comparison of this kind. The worker spends 8 hours a day at his work and 15 hours a day at home to which must be added the fact that a much greater number of people are exposed to accidents in the home.

tive man, yet our annual fire loss has increased 100% during the past 20 years in spite of the fact that we are spending three times as much for fire departments as we did two decades ago.

If each of the buildings which were destroyed by fire in the United States last year could be placed on a fifty-foot lot they would line both sides of a street reaching from New York to San Francisco. Every quarter of a mile an injured person would be crawling from the ruins, while a charred body would be found every third of a mile. Approximately 10,000 persons are burned to death each year, one third of them being children, and two thirds of them having lost their lives in residences. Mr. Fleming presents a startling picture when he says:

The 122,000,000 citizens of the United States, on a stated day, gather together in one place. A line of trucks bearing $500,000,000 in United States currency carry their load to the edge of a great pit and dump it in. It is saturated with gasoline, and a match applied. As this fortune goes up in smoke, 10,000 people are shoved into the burning pit.

After this holocaust is over it is found that thousands of factories, homes, farms, hospitals, and public buildings no longer exist, and thus an army of men are thrown out of work. Cities and states are forced to raise their tax rates to compensate for the property which no longer pays its share of the cost of government.

If such a thing as the above happened, every newspaper in the civilized world would carry scareheads. It would become the main topic of conversation in a hundred nations. It would be denounced as the great crime in history. Yet, in effect, this result actually occurs annually in the United States. Very few people give it any particular thought because it doesn't happen at a given moment on a given day—it happens throughout the year. It represents our national fire bill.

According to the Bureau of Railway Economics, American Railway Association, the safest place in the world seems to be on a railroad train. Only 28 passengers lost their lives in railroad accidents in 1932, and only 46 in 1931. This number increased, however, to 50 in 1933. But safety in railway travel is now taken as a matter of course, and the public associates railroad accidents only with grade crossings, and the major portion of the grade-crossing accidents are due to no fault of the railroads but entirely to the carelessness of automobile drivers and pedestrians.

The results of accident prevention work and the installation of safety devices for the operation of trains by the railroads have been remarkable. In 1913 they reported to the Interstate Commerce Commission a total of 10,964 fatalities[7], of which 350 were passengers, 3,715 em-

[7]Includes only deaths that occurred within twenty-four hours of the accidents.

ployees, 1,122 grade crossing, 364 other nontrespassers, and 5,413 trespassers. It is interesting to note that approximately one half of the fatalities were trespassers.

The next 20 years produced a record of steady reductions until in 1933 the railroads reported a total of only 5,019 fatalities of which 50 were passengers, 532 employees, 1,438 grade crossings, 208 other nontrespassers; and 2,791 trespassers. It is a record of which the railroads may well be proud.

Approximately 17,500 persons were killed during 1933 in accidents occurring in public places but not involving a motor vehicle. As we have seen, approximately 5,000 of these were killed on or by steam railroads.[8] Many of the remaining 12,500 were killed in other forms of transportation accidents such as street railways and airplanes while the balance were killed by falls, burns, scalds, explosions, drowning, firearms, excessive heat, etc. In addition there were 2,160,000 nonfatal personal-injury accidents of which about 60,000 were permanent in character. The estimated cost of these public (not motor-vehicle) accidents—wage loss, medical expense, and insurance overhead—is about $450,000,000.

This, then, is the picture: Approximately 100,000 men, women, and children killed each

[8]This figure includes motor-vehicle and employee fatalities listed as railroad accidents.

year. More than 300,000 permanently disabled —with some exceptions of little use to themselves and less use to society. More than 8,000,000 injured, some of them only slightly and some of them so seriously that they are not fully recovered for periods of months or even years. An annual economic loss running into figures so large that they stagger the imagination.

Like the famous "six hundred" in the Charge of the Light Brigade, there are accident hazards to the right of us, to the left of us, in front of us, and behind us. Most of them can be eliminated without putting the slightest curb on our activities or without refusing to permit our children to do any of the things that they like to do, that are worth while, or that it is good for them to do. A little bit of thought on the part of each intelligent individual making up the great general public will do the trick. A little intelligent action on the part of communities, state legislatures, and the federal government will force that little bit of thought on the reluctant, the careless, and all of those who refuse to believe that they have any responsibilities to their families, their co-workers, or their neighbors.

But until we do acquire a great body of public opinion with regard to this great menace, the accident rate will continue to mount, and the waste in human life and human suffering will continue to grow.

CHAPTER II

The Open Road

EVERY STATE in the Union protects wild animal life with a variety of legislative commands and prohibitions and official organizations to enforce them. In some states it is a serious offense to kill certain kinds of game "out of season" and in some instances it is quite as serious an offense to kill certain birds and wild animals at all.

But it is always open season for the men, women, and children who make use of our streets and highways—at least, in many states. In fact, only 9 states can be said to fully protect citizens on the open road. By full protection is meant operators' license laws with mandatory examination of new drivers; state police or state highway patrol force; some degree of similarity in the regulation of motor vehicles; and the coöperation of the courts with the police in the enforcement of those regulations, plus good roads, proper street and highway illumination, good road signs, etc. Just think of it! 19 states

have no drivers' license requirements.[1] In 7 states there are no minimum age requirements for the driving of an automobile[2]—presumably any child old enough to operate a kiddy car has the state's full permission to drive a motor vehicle. In only two states—Idaho and New York—is the minimum age limit as high as 18 years. In the others it ranges from 13 to 16 years. Yet accident statistics prove conclusively that the dangerous age, in so far as driving a motor vehicle is concerned, is between 16 and 21. How often do we see some such headline as appeared in the New York *Times:* "Boy, 12, killed by auto driven by lad of 13?" In many states the farmers have fought a minimum age law successfully with the plea that it was necessary for their children to drive the family flivver to school or town, or the farm truck to market.

There are many other curious items of information in connection with the failure of so many state governments to regulate properly the operation of motor vehicles when presented side by side with the facts concerning motor-vehicle accidents, their frequency and severity. No less than 26 states do not require a driver to come to a full stop at a railroad crossing. Nine

[1]Alabama, Arkansas, Florida, Georgia, Idaho, Illinois, Louisiana, Mississippi, Montana, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Texas, Utah, and Wyoming.

[2]Arkansas, Mississippi, North Dakota, Ohio, Oklahoma, Tennessee, and Texas.

fail to require the reporting of a personal-injury accident.[3] Thirteen permit passing on hills and curves. Every state but 5 permits the use of spotlights or searchlights—a prolific source of accidents at night—while 34 states do not require a driver to dim his headlights on the approach of another vehicle.[4] Many states permit the use of stickers on windshields, interfering with or obscuring front vision, and on the rear window, obscuring the rear vision. Eight states do not require the use of hand signals.

Some states have no definite speed limits on the open road, confining themselves to the statement that the driver, at all times, shall drive at a rate of speed which is "reasonable and proper," leaving it to the police or the courts to define what is "reasonable and proper" under any given set of conditions. This is more desirable than definite speed limits on the open road. In others speed limitations vary from 30 to 45 miles an hour in rural districts and from 15 to 35 in residential districts. Some states have limited the speed on curves—in Mississippi this speed is as low as 10 miles an hour. In most of them it ranges from 15 to 25 miles per hour.

The question of speed has always been the

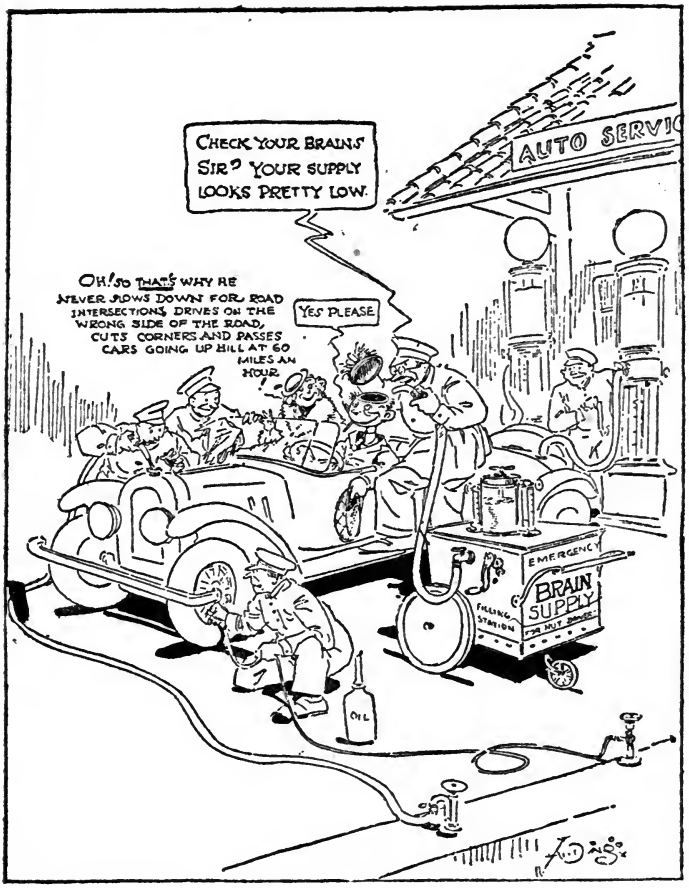
[3]A rigid requirement for the reporting of all and every kind of an automobile accident with severe penalties for failure to do so is absolutely necessary if the motor-vehicle accident rate is to be reduced.

[4]See Chapter XIV dealing with the proper illumination of streets and highways.

subject of considerable controversy. Our grandfathers considered 15 miles an hour "sinful," as witness the board of education which refused the use of a schoolhouse for a debate on the railroads because they were reported to have attained that speed. One school of thought insists that the slow-moving vehicle is a greater menace on the highway than the speed maniac. Another claims that speed is the principal contributing factor in the motor-vehicle accident record. One thing is certain—an automobile going 60 miles an hour will hit a pedestrian or another vehicle with considerably more force than one moving 20 miles an hour and can be expected to do considerably more damage.

The horse-drawn vehicle is the recipient of innumerable curses, not because automobile drivers dislike horses, but because of its slow-moving characteristics in comparison with the modern motor vehicle. "Speed" and "sustained power" are the two headlines used more than any others by automobile manufacturers in appealing to the motorcar consuming public. It is a fast-moving generation, and it is a question as to just how much it can be slowed down and what kind of a slowing down process is practical.

What are the principal factors responsible for a condition of affairs which permits the motor vehicle—one of the most useful devices ever invented by man—to kill approximately



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AH, THEN MAYBE WE'LL HAVE SAFE DRIVING CONDITIONS

31,000 men, women, and children each year and maim nearly 1,000,000 others? Can we blame it on the automobile itself—faulty engineering which makes it difficult to control and causes it to fail mechanically at exactly the wrong time—or on the roads over which it is operated? Or is the principal fault a human one—something which would indicate that a very considerable portion of our population consists of persons so lacking in intelligence or in their regard for the rights of others that they are not fitted to use these modern conveniences? Let us see what some of the authorities who have made a life study of the subject have to say about it.

Colonel Robbins B. Stoeckel, for many years commissioner of Motor Vehicles of Connecticut and now professor of Highway Transportation, Yale University, tells us that "automobiles are not ferocious . . . it is man who is to be feared." In his opinion "continual conservative performance alone is the course of conduct which eventually will make the driver safe and sound . . . conservatism must become a habit before the driver is safe for himself and others."

Benjamin G. Eynon, former Motor Vehicle commissioner of Pennsylvania, says flatly that "traffic safety is 95 per cent education and 5 per cent enforcement." To him, the biggest problem is the education of automobile owners and drivers. In the same strain George R. Wellington, president of the Eastern Conference of

Motor Vehicle Commissioners, says that "we have a most serious accident problem because we are not efficient as motorcar drivers . . . it is evident that we take to the road with insufficient training; therefore, the remedy for this problem, to a considerable extent, lies in the failure to appreciate the necessity for proper training plus a similar failure to understand and discharge moral and legal obligations to fellow users of the public highways."

On the other hand, Raymond Cato, chief of the California Highway Patrol, tells us that "the control of traffic accidents rests in a coordinated action of three great factors: First, the factor of engineering; second, the factor of enforcement; third, the factor of education." It is interesting to note that this policeman puts education last. Harold G. Hoffman, Motor Vehicle commissioner of New Jersey, blames recklessness, selfishness, and faulty judgment of motorists for most of the automobile accidents, urges "an effective educational program which would make the motorist feel that laws enacted are to help him and not harass him" and demands a more "rigid examination of drivers and vehicles, as well as more effective exercise of the powers to revoke licenses of consistent offenders."

Charles A. Harnett, veteran commissioner of Motor Vehicles of the state of New York, sums up the whole question when he says:

I believe that rigid examination of applicant's competence to operate a motor vehicle; constituted authority to suspend licenses for due cause and revoke when circumstances demand; compilation and publication of motor-vehicle accident statistics covering entire field as how, when, where, and why accidents occur; the extension of automatic traffic light signals to every highway intersection; the construction of wider highways, and a courteous but strict enforcement of all laws affecting motor-vehicle operation, comprise the best and necessary means of accident prevention.

Out of the experience and conclusions of these and many others engaged in the work of making our streets and highways safer[5] we get a clear impression that about 99 4/10 per cent of the fault lies with the drivers and about 6/10 of 1 per cent of the accident rate is due to other causes. The actual fact is that about 85% of the fault lies with the driver and 15% is due to other causes. Automotive engineers have made the motor vehicle as nearly foolproof as human ingenuity can make any man-made machine, and highway construction has progressed to a point where some of our streets and highways are marvels of engineering skill from the standpoint of safety and usefulness, except for a

[5]See letter addressed by Albert W. Whitney, associate general manager in charge of Conservation, National Bureau of Casualty and Surety Underwriters, to municipal and State authorities, Appendix C.

curious lack of progress in illumination.[6] Certain types of legislation and certain forms of traffic control have demonstrated their practicability as well as their efficacy when properly enforced. There only remains the human being —his efficiency, his reaction time in moments of emergency, and his general attitude toward others who have, with him, an equal right to the use of the open road.

It cannot be denied that a very large percentage of automobile accidents are due either to a sad lack of proper motor-vehicle laws and regulations or a reluctance on the part of the police and the courts to enforce those that are in existence. These questions will be the subjects of later chapters. It is only necessary to note at this point that failure to enforce motor-vehicle laws, rules, and regulations is due, in a very large measure, to the attitude of the public, and particularly the motoring public, which might be said to *be* the American public. This brings us right back to the driver and the human element. Too often the driver looks upon the traffic officer as an enemy, listing him as "Public Enemy No. 1," while laws forbidding him to do this and commanding him to do that are simply complexes of stupid legislators who belong to another generation and another time.

[6]It should be noted, however, that highway construction is a comparatively new science, that demand has increased more rapidly than financial ability to supply, and there is still much to be done.

The insurance companies list some 23 causes of automobile accidents of which the most important—those which cause, by far, the largest number of accidents—are driving too fast for conditions; driving on the wrong side of the road, and failure to give right of way. All of these are deliberate acts of the driver, and while road conditions and obscured vision may be contributory causes, the fact remains that primarily the driver is at fault, and inexcusably at fault. The records show that physical defects of the driver and failure of the car or equipment are almost negligible. In this day and age faulty brakes, faulty headlights, or bad tires are human faults and not the fault of equipment *per se*. There is no excuse for any of them.[7]

Certain facts concerning motor-vehicle fatalities are interesting. In 1933 the rate of death per accident was 67 per cent higher between intersections than at intersections, and this difference is attributed to the greater speeds usually prevailing between intersections. At rural intersections the rate of death per accident was 114 per cent greater than at street intersections and again the difference is attributed to the higher rate of speed prevailing on the highways. On highways the rate of death per accident was 118 per cent greater than the average

[7]For complete details as to types of accidents, classification by age, distribution of child and adult motor-vehicle injuries, see Appendix D.

for all accidents combined and was 167 per cent greater than the death rate between intersections. The rate of death per accident on the highways was also 219 per cent greater than on city streets. No matter how the statistics are analyzed, the answer is always the same: speed is the main contributing factor to these fatalities.

Since 1927 there has been a continuous drop in the fatalities to children under 14 years of age indicating very clearly that the progress of safety education in the public schools and the ability of the individual to adapt himself to his surroundings are bearing fruit. It is claimed that safety education has saved the lives of more than 32,000 children of school age during the 7 years from 1925 to 1931 inclusive. On the other hand, there has been a continuous advance in the number of fatalities among adults and elderly persons.[8]

There are many optimists who point to the improvement in the accident rate for 1932 over the rate for 1930, the number of fatalities in the former year being 4,500 less than in the latter. But it must not be forgotten that to date automobile accidents have varied in direct ratio with the number of passenger car miles driven —that is, surveys have shown that there are just about so many accidents per 100,000 or 1,000,000 miles of automotive transportation, and that therefore the total number of accidents varies

[8]See Appendix E for charts showing trends.

directly with the use of the automobile. At the beginning of 1930 the depression was beginning to get into its stride, and before the year was over was in full swing; hundreds of thousands of people either gave up the use of their automobiles entirely—voluntarily or forced to by some finance company—or greatly curtailed their use because food seems to be more important than gasoline or oil. If the depression is actually over, and if we are on the road to economic recovery, the use of the automobile will increase rapidly, and we can expect to see the street and highway accident rate start climbing again. In fact, this is already happening—1933 figures show an increase of 1,500 fatalities over 1932. It should be noted here that the number of automobile fatalities not only shows a numerical increase in 1933 over 1932 but an increase per 100,000 of population, an increase per 100,000 cars and an increase per 10,000,000 gallons of gasoline consumed.

In spite of the attitude of the average motorist toward traffic laws and regulations and toward the traffic officer seeking to enforce them, there is a constant cry on the part of the general public for more rigid enforcement of such laws as we have and a demand for the elimination of the inefficient, irresponsible, and reckless driver. Can it be shown that rigid enforcement does get results or that education—particularly in the

public schools—reduces the accident rate? It can and has been.

Time of day is an important factor in the automobile accident rate. In 1933, 413,890 automobile accidents resulting in 13,750 deaths occurred during the normal daylight hours of 6 A.M. to 6 P.M. During the normal hours of darkness, 6 P.M. to 6 A.M., there were 342,610 accidents resulting in 16,230 deaths. The important fact is that the rate of death per accident was 43.5 per cent higher during the hours of darkness than during the hours of daylight. During the four rush hours of 6 to 10 A.M. there were 2,550 fatalities, while during the rush hours 5 to 9 P.M. the deaths numbered 9,720. The deaths during the four evening hours exceeded the record for the four morning hours by 281 per cent.

Automobile accidents during the hours of darkness are much worse in their consequences than those of daylight, because cars at night are invariably driven too fast for the range of visibility afforded by headlights. When dependent solely on car illumination the safe operation of automobiles at night demands that speed never exceed a stopping distance of approximately 100 feet.

No matter how we examine the facts with regard to motor-vehicle accidents, we find ourselves constantly returning to the driver—his intelligence, efficiency, condition, attitude, etc. He

is the factor that must come under control, and at the very foundation of this control lies the driver's license. Once the state grants permission to drive an automobile, the individual is turned loose on the streets and highways armed with something quite as deadly as an automatic or a high-power express rifle. He becomes a potential killer, albeit an involuntary one. If the public attitude toward this class of accidents is to be one of prevention rather than compensation it is at this point—the very start—where the greatest care and attention are demanded. Every test which is practical should be made regardless of trouble, time, and expense. It is the duty and obligation of motor-vehicle officials to see that they are made and that the applicant is fitted temperamentally, physically, and mentally to be given the right to drive.[9]

Furthermore, the authorities should have the absolute right and should exercise the right to suspend or revoke licenses for cause which, in their judgment, is sufficient. In fact, it is quite possible to have a combination of circumstances where the motor-vehicle administrator should be given the right to hold the driver's license, thereby keeping him from the road until the proper authorities can determine whether it should be returned to him or not.

[9]An applicant may be the finest kind of driver in the daytime and a menace to everybody on the road at night. There is such a thing as night blindness. This is only one of the many details demanding consideration in formulating tests of driving ability.

The next step in the control of motor-vehicle traffic in such a way as to reduce accidents is proper state and municipal legislation. Without proper laws and ordinances coupled with the authority to enforce them, the motor-vehicle official is helpless. This raises at once the question of the importance of uniform motor-vehicle laws as between states and uniform motor-vehicle ordinances as between cities.[10] A very considerable percentage of the total number of automobile accidents are due to the confusion which arises from the multitude of different kinds of laws, rules, and regulations.

The tourist, driving from one state to another, or even from city to city within the same state, comes in contact with all sorts of conflicting rules of the road which he cannot be expected to know very much about and which he can hardly be expected to remember. A driver traveling from New York to San Francisco will violate a hundred provisions of the motor-vehicle laws and ordinances, no matter how conservative a driver he may be. Traffic-control and directional signs help some when they are explicit and properly displayed, but uniformity would accomplish more than all of the traffic-control signs and signals to be found in a month of traveling. After years of study the National Conference on Street and Highway Safety has produced a

[10]See "The National Conference on Street and Highway Safety," Appendix B.

model Uniform Motor Vehicle Code. The experiences of states which have adopted this code in whole or in part, or have revised their existing motor-vehicle laws bringing them into harmony with it, offer convincing evidence of its utility and effectiveness.

It has been proven conclusively that adequate licensing and traffic-control laws properly enforced have reduced accidents approximately 30 per cent in those states which have them in comparison with those states which do not. Why, then, are there so many states which are so "backward" in this regard? Largely because of the resistance of the public. Motorists are particularly jealous of what they consider to be their personal liberties. Traffic laws are "salutary" laws. Criticizing the reckless driver and the road hog, they do not want any prohibitions put upon their own methods of driving.

How often do we hear the expression, "I'll never have an accident," or "I've driven twenty years and never had an accident?" These same drivers do not realize that laws for the control of automobile traffic are as much for their protection from "accident prone" drivers as for the protection of others against themselves. This is where, in my opinion, the attempts to educate the public have failed. Every driver, consciously or unconsciously, thinks he is accident proof. He does not realize that he cannot know what the other fellow is going to do to him, and

that he is just as much in need of protection as a six-year-old child playing in the street.

We have seen the record for 1933—31,000 dead and 1,090,000 injured, of these 90,000 were permanently disabled. The automobile may be no longer a toy or a luxury—we can consider it as a commodity and a necessary part of the equipment of our everyday life. But it can hardly be denied that it is also an engine of destruction dealing out not only death and injury but causing an economic loss each year of no less than $2,500,000,000. This annual property loss is five times as great as the gross funded debt of New York State and somewhat greater than the gross funded debt of New York City.

The whole question resolves into one of individual responsibility, if we are to obtain the full use and benefits of the automobile and at the same time solve the problem of accident severity and frequency. When owners and drivers cannot be made to understand, or refuse to accept, their individual responsibility, they must be forced to understand and accept by drastic laws and hard-boiled enforcement officers. There is no more place in automotive transportation for the reckless, irresponsible, or criminal operator of a motor vehicle than there is in railroad, street railway, or air transportation for the drunken or careless engineer, motorman, or pilot.

CHAPTER III

He Saved a Minute——

SOMEWHERE in the preceding chapters it was stated that accidents do not happen—they are caused. Suppose we go a bit further and say that there is no such thing as an accident except those incidents which are the result of some great force in nature over which we have no control, as, for example, lightning or a tornado. Then a logical definition of the word "accident" might be "something which happens without known or assignable cause" or, "anything happening wholly without apparent cause and entirely beyond the control of any person or thing." If these are proper definitions, then it is just as proper to say that there is no such thing as a motor-vehicle "accident," or a railroad "accident," or an industrial "accident."

Yet we know that there are literally millions of so-called "motor-vehicle accidents"—incidents due to the operation of automobiles which result in loss of life, personal injury, property damage, or which might have resulted in any one of these three things. Actually they are mis-

haps to humanity having easily identified causes established by the carelessness, inefficiency, indifference, or neglect of some human agency. In other words, *they are avoidable.*

If ever we are going to learn how to "avoid" these accidents on the streets and highways which "are caused" and do not "happen," we must give some consideration to the mental attitude of the average man or woman with regard to the automobile and automobile driving—his or her "state of mind," so to speak. What is it that causes an otherwise sensible and intelligent person to take a 17,000,000 to 1 shot? The average remaining span of life at the age of 35 years is approximately 33 years or about 17,000,000 minutes. This is a lot of time to gamble against the saving of a single minute which, of itself, has no value except in some grave emergency.

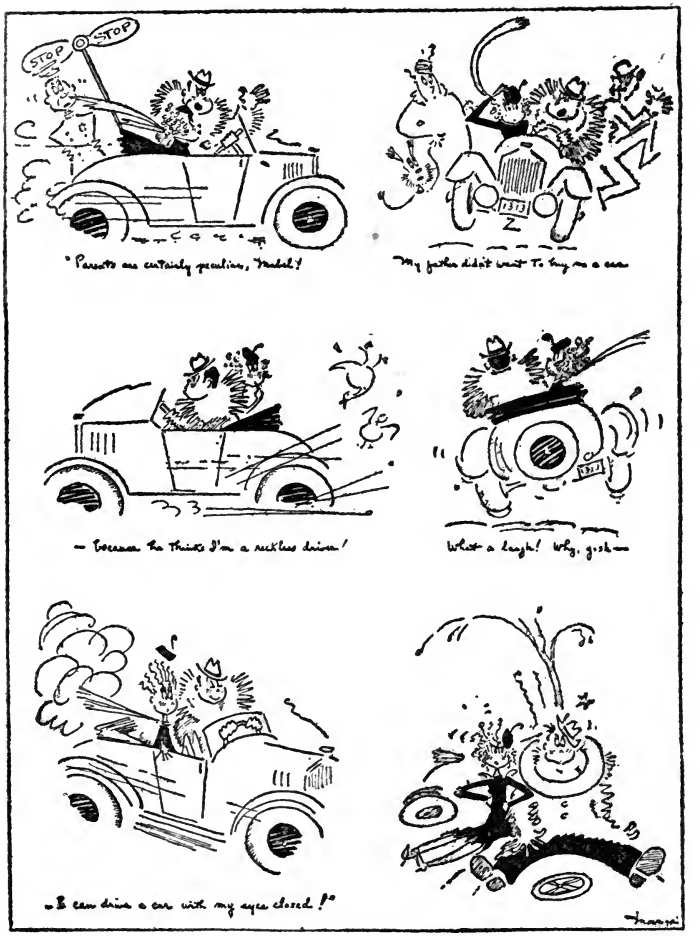
What is it that causes so many pedestrians to dart across a busy thoroughfare, against a red traffic signal, and then turn around to watch the traffic go by? What satisfaction is there in beating a railroad train across a grade crossing? Why do so many drivers on a two-lane highway dart around another vehicle in the face of an oncoming faster vehicle or a ten-ton truck? Why this apparent hatred of granting the right of way, or why does the road hog drive down the middle of the road inconveniencing and even endangering all traffic in both directions?

What are the psychological causes for this

mad haste, this seeming desire for speed, a type of mania which has taken such a strong hold on the present generation? Is the overpowering urge to get from one place to another in the shortest possible time or to "beat the other fellow to it," a cause or an effect? Is the motor vehicle itself responsible for the infection, or is the American demand for haste responsible for the automobile and its present high state of perfection—its great power and speed?

These are important questions and in the answers to them lies at least a part of the solution to the motor-vehicle accident problem, for tied in with them are all of the questions of licensing automobile drivers, legislation, law enforcement, the construction of highways, and a host of other factors which go to make up what we call "automotive transportation." If we accept driving too fast for conditions as one of the major causes (if not *the* major cause) of the high motor-vehicle accident rate, then "speed" must be controlled—and by speed I mean the unreasonable speed of a few seconds due to a desire to "beat someone or something to it," as well as the speed of 60 or 70 miles an hour on the open road when conditions do not warrant any such speed.

The reasons (if they can be called "reasons") for driving at a high rate of speed are many, ranging from pride of performance to an alleged need to get some place else in the



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LET'S CONSIDER THE YOUNG DRIVER

quickest possible time. There are, of course, exceptions when what seems to be an unreasonable speed can be justified, such as that of a doctor answering an emergency call. Pride of performance—showing off—exhilaration, or mere haste provides no excuse for unreasonable speed. Furthermore it accomplishes little, as we shall presently see.

Curiously enough, it frequently happens that the reason for speed is a very real dislike on the part of the driver for driving under present-day traffic conditions. He has to go somewhere, and he wants to get it over with as quickly as possible. The author once heard a Sunday golfer boasting in the locker room that he had driven from his home to the club, a distance of ten miles, in eleven minutes. Asked why he was in such a hurry, he thought a minute and replied, "Well, to tell the truth, I hate like the devil to drive on Sunday, and I always want to get it over with as soon as possible." To many people, driving on a congested thoroughfare on Sunday, or on a holiday provides about as much pleasure as a trip to the dentist.

But under present-day traffic conditions this "speed" beyond certain maximum limits is rarely a time-saver. A few years ago the officials of a certain large city determined to find out just how much time could be saved by a reckless driver competing with a conservative driver.

Two police cars were placed in charge of expert drivers. Each carried, in addition to the driver, a policeman, a newspaper reporter, and an official observer.

The two cars started at the outskirts of the city and were driven through it over a route which included the most congested districts. The driver of the first car ignored all automatic traffic signals, red lights, traffic officers, and even the most fundamental principles of decent and safe driving. He wove in and out of traffic, passed other vehicles on the left or on the right, drove on the wrong side of the street, refused to grant the right of way—in fact, gave a good exhibition of a fire chief getting to the scene of some great conflagration, or a police chief on his way to a riot.

The driver of the second car obeyed all of the rules of the road, stopped when traffic signals were against him, observed all local ordinances and, while he drove at the maximum safe speed justified under conditions as they existed, did nothing for which he might receive a summons or even a "bawling out" by an officer.

The distance was one of several miles. The first car, driven by the "reckless" driver, arrived at the destination of the two cars on the other side of town just four minutes ahead of the second car. It had narrowly missed being in a score of accidents, had frightened innumerable

old ladies, had scraped one or two fenders, and had run over a dog—to save four minutes. Can it be possible that any intelligent person would say it was worth it? Yet this country is filled with drivers whose driving is marked with these same characteristics and who are constant contributors to the tables of accident statistics.

These drivers are not natural "killers." There are, in fact, very few operators of motor vehicles who do not go through a prolonged period of mental distress if they become involved in accidents causing serious personal injury or death. But, as we have noted before, most experienceed drivers who have never had an accident feel quite sure that they will never have an accident—at least, a serious accident. It seems to be a part of the psychology of motorcar operation. No matter how many narrow escapes they may have, the "big crash" will never happen to them.

But an accident is an accident whether it results in a fatality or merely in a bent fender, and every accident is filled with potentialities for personal injury. An accident which is the result of reckless driving or "driving too fast for conditions" should be dealt with by the authorities without regard to the seriousness of its outcome. The circumstances which surround the killing of a chicken or a dog may furnish information which is quite as illuminating as the circumstances which surround the killing of a

child.[1] Either or both may indicate that the driver's license should be revoked because of psychological unfitness for driving.

"Driving too fast for conditions." This is the real offense—the real charge. Nine out of ten motor-vehicle accidents are due to some definite error on the part of the driver, or a pedestrian, or both. Every mile of driving calls for some almost instantaneous decision on the part of the driver, just as every minute of walking on the streets of a crowded city calls for some kind of a decision on the part of the pedestrian. Human decisions, most of which may be minor in character, but they may be the cause of circumstances of major importance. It is the American inclination "to take a chance" that translates many decisions of trifling importance into tragic incidents. The error may be one of driving too fast for conditions, insistence on the right of way, driving on the wrong side of the road, passing on a hill or dangerous curve, inattention, or any one of a score of others. If the careless or reckless driver makes it—all well and good. If he doesn't, it is just "too bad" for someone.

The pedestrian is almost as much to blame as the automobile driver in accidents involving both pedestrians and motor vehicles. An anal-

[1]The reporting of every accident, involving personal injury or property damage, should be mandatory, with penalties for failure to report.

ysis made by a large insurance company of actions of pedestrians involved in accidents in 1933 shows that in many instances pedestrians took their own lives in their hands. More than 800 were killed in crossing intersections against signals, and 360 met death crossing intersections diagonally. More than 3,300 were killed crossing streets between intersections, 1,460 met death darting out into streets from behind parked cars, and 2,250 were killed while walking along rural highways. The figures also show that 1,680 children were killed while playing in the streets.

The experience of pedestrians shows that the rate of death per automobile-pedestrian accident was 28 per cent better at intersections than between intersections and 25 per cent better in crossing intersections with the signal than against the signal. The most dangerous thing that a pedestrian can do is to walk on a country highway, as the rate of death per pedestrian accident on highways is nearly 360 per cent worse than the average death rate for all automobile-pedestrian collisions combined.

Well, what are we going to do about it? Assuming that all of these things are true, how are we going to stop this unreasonable haste if it is the real cause of the high motor-vehicle accident rate? By law, say the average American promptly. It is a curious characteristic of the American people that just as soon as they are

faced with a problem which involves social welfare they call for a law without much regard to the questions of practical methods and difficulties of enforcing it. Yet we are just as quick to claim that an unpopular law cannot be enforced in this country, and nowhere will one find a better example than in the motor-vehicle laws. A number of states have very splendid motor-vehicle laws, but enforcing them is "something else again." This, however, is another story reserved for a succeeding chapter.

Violators of traffic laws, rules, and regulations—it might be better to say "violators of conservative driving practice"—can be divided into two great classes: those who are ignorant or unintelligent, and those who deliberately disregard them. There is no excuse for either. Intelligent drivers do not have to be taught the principles of conservative driving, nor do they have to memorize laws—they know them by instinct and experience. If they are not intelligent, they should not be driving motor vehicles. Deliberate disregard is sufficient justification for refusing them the use of the streets and highways.

This brings us up against the whole question of permission to drive a motor vehicle. Is it a right or a privilege? Owners of the 26,000,000 motor vehicles in the United States say that it is a right. The automobile is responsible for our great system of good roads, and they, the

motorists, pay for them—by the payment of all sorts of taxes. The roads belong to the people, and the motoring public are the people.

Looking at it in one way, this sounds like a reasonable point of view. The modern highway is built for the motorist and is paid for by him in one way or another. The trouble with it is that it does not go far enough. Every motorist has the right to use the highways, but only so long as he uses them properly, with due regard to the rights of other motorists and pedestrians as well. It therefore becomes a privilege which he is given the right, by virtue of a license given him, to exercise, just as a public utility is given the right to serve a community at a profit to itself as long as it observes the public utility law and gives a maximum quality of service at a minimum rate consistent with good business practices.

Until the motoring public can be educated to use these streets and highways properly, it will have to be forced to so use them, and the only way this can be accomplished is by adequate licensing laws with an established authority which grants the privilege or takes it away, as circumstances may require. This authority can determine whether the applicant is apparently "fit" to operate a motor vehicle, knows how to operate a motor vehicle, and then grant a license to operate a motor vehicle which, however, can be suspended or revoked by the authority at any

time.[2] The fact that he has a license will not prevent a motorist from having an accident, but it does give the authorities control over him to some extent. It also makes it possible to eliminate him from the highways if he becomes involved in an accident due to his inefficiency and determines at the outset his physical and mental fitness to some extent.

One of the most important questions in connection with licensing automobile drivers is the question of a minimum age. Leaders of the safety movement have all sorts of difficulties in persuading legislatures to establish a reasonable minimum age limit, in spite of the fact that much data tending to show that accidents per 100 operators are more numerous in the lower age classifications have been collected.

It is during this period—between the ages of 15 and 19—that boys and girls begin to learn to drive. It is also during this period that they have, to put it bluntly, the least sense. They are either prone to take chances or do not realize what chances they are taking. It is also at this period that they are least regardful of the rights of others. They are "sitting on top of the world," it belongs to them, and the experience and advice of older persons play little or no part in their scheme of things. We can hardly

[2]For a detailed description of mental, physical, and operating tests which have been devised for use in connection with the granting of licenses see Appendix F.

expect them to have any other attitude toward life at this age, but we can take care that we do not place in their hands instruments of destruction which they are not fitted by age or experience to handle.

This does not mean that every child who has reached the age of 17 or 18 or 19 should be refused permission to drive an automobile. Such a suggestion would be silly. Many boys and girls of this age are far better drivers than their parents and much more thoughtful when it comes to the rights of others. But the authorities should exercise much greater care in the examination of applicants who are minors, and parents, presumed to know their children better than anyone else, should give the matter much thought before giving their approval to the granting of licenses to minor children. Under no circumstances should an application be granted without the approval of parents or guardians.

The question of maximum age limits is also important. If there should be a minimum age limit, there certainly should be a maximum age limit, although older drivers have a lower accident rate than young drivers. However, there must be a very definite maximum age limit above which it may be said that with rare exceptions the applicant is "too old" to drive.

Most men are quite willing to admit that women "just don't know how to drive an auto-

mobile" and are "a constant menace on the highways." How often does one hear the expression "just another damn fool woman" or "I don't see why they let women drive automobiles, anyhow." Unfortunately the statistics do not seem to establish the value of such conclusions. In one study, at least, in an area where slightly less than four operators were involved in an accident for every 100 operators driving cars the mere men didn't show up very well. For the male operators the proportion of accidents to operators was about 4½ per cent, while for the females the ratio was only 1 per cent. In fact, if we could analyze motor-vehicle accidents by the sex of the drivers with due regard to the exposure on the basis of miles driven, we would probably find that women drive, on the whole, quite as well as men.

Theoretically, one would think that the chances of an accident must decline in direct ratio with the experience of the driver, but this is not the case. Naturally, the newest operators have the worst accident records, but after the first three months there is a marked and curious change. In the first three months of operating experience 9 out of every 100 drivers are involved in an accident. This drops off to 2 out of every 100 among operators with from 3 to 6 months' experience. Then the situation grows consistently worse, so that among all operators with more than a year's experience there are

about 5 involved in accidents for every 100 driving. In other words, drivers with more than one year's experience are nearly twice as liable to have an accident as those having less than one year's experience.[3]

Here, again, we are faced with the psychology or "state of mind" of people driving automobiles. The experienced driver who has not had an accident is quite sure he is never going to have one and is much more inclined to "take a chance" than the less experienced driver. You can't legislate a "state of mind" into an automobile driver, but when a traffic officer catches one "driving too fast for conditions," experience should be no excuse, and he should be treated in the same way and suffer the same penalties as the inexperienced driver—that is, if we are going to believe our accident statistics.

And so, no matter how we approach this subject of the causes of motor-vehicle accidents, we constantly return to the human element, the attitude of the motor-vehicle driver toward other people on the road. From the standpoint of age we find the youngster more inclined to take chances. From the standpoint of experience, the experienced driver is more dangerous than the inexperienced driver. From the standpoint of sex, women seem to be as alert, as

[3]In reaching any conclusions, however, we must not disregard the factor of "exposure." Experienced drivers are likely to drive many more miles than inexperienced drivers.

conservative, and have an accident experience comparable with that of men. The statistics seem to wash out many of our preconceived notions. There still remains "the condition of the driver."

One might think that physical defects would be the cause of many fatal and non-fatal personal injury motor-vehicle accidents, but this does not seem to be the case. In fact, it is almost negligible. More than 95 per cent of the operators having accidents have at the time of the accident no physical or mental defects which prevent the efficient operation of a motorcar. Poor eyesight is reported in less than one per cent of the cases. Driving while drinking, however, is, to use an expression I have used before, "another thing again."

In nearly 5 per cent of the fatal accidents reported the driver is described as "had been drinking." In some areas the number of "had been drinking" drivers is well above this average. Michigan reports it as 8 per cent and California as 9 per cent. This raises a question which at first caused insurance underwriters many sleepless nights—what was going to happen under repeal of the Eighteenth Amendment, and what effect on the accident rate was the new social attitude toward drinking going to have, now that we have legal liquor and anyone can get it almost anywhere at almost any time?

The present generation has had no experience

with legal liquor, yet it has been brought up to consider that drinking is quite the proper thing —that it was something forbidden by a highly improper law which it was "smart" to disregard. The result is an entirely new social attitude toward intoxicating liquor and drinking places in general. Women frequent them quite as openly as men, and the beer bar, or any other modern equipment for drinking, is quite as respectable as a hotel dining room or a drug-store counter.

Thirty years ago, when automobiles were few and saloons flourished, it was inexcusable for a young man to go to a dance with the slightest odor of liquor on his breath, and the man who carried liquor in a flask "on his hip" was just a bum. Now either is quite the thing to do, and intoxicating liquor has no more burden of social disapproval than the cigarette or the lipstick. No longer do we have to depend on the bootlegger, fear the police or federal officer, or pep up our parties with etherized or cheap alcoholized concoctions. Good liquor is available anywhere, and it is quite proper to possess it.

In the meantime the number of automobiles in daily use has increased during the past fifteen years from 6,000,000 to 23,500,000. Boys and girls by the hundreds of thousands are driving them with the same nonchalance that they rode bicycles a generation or two ago. It has been fairly well demonstrated that gasoline and

alcohol don't mix very well from an accident point of view. What's going to happen?

Just prior to the time when repeal actually went into effect there was some indication that accidents in which the driver involved was reported as "had been drinking" were increasing at an alarming rate, and insurance company officials feared that it was due to a general letting down of the bars in anticipation of repeal. Some of them accepted it as an index of what was going to be a permanent condition and prophesied that the motor-vehicle fatality rate might jump 30, 40, or even 50 per cent almost overnight.

Fortunately, there are many indications that repeal is working the other way. People now can get good liquor without dealing with bootleggers, and it is safe to assume that at least some of the excessive speakeasy drinking has been changed to moderate drinking in the home. One can get a drink almost anywhere at almost any time of the day or night, and it no longer seems necessary to take a large number of drinks in a comparatively short space of time just because one has succeeded in breaking into a speakeasy or roadhouse. Drinking is being done in the open, in full view of the public, and seems to be more conservative and dignified.

However, the problem of operating a motor vehicle while drinking will always be a problem for the insurance underwriters and, perhaps, for

the automotive industry and the distillers as well. Driving while drunk is a serious offense, but our experience has been that it is extremely difficult to prove in court that a man was drunk at any given time. Can we make the offense "driving while drinking"? In other words, if a man has an accident and it can be shown that he has had even one drink of hard liquor, should he be penalized just as though he had been driving while drunk? One thing is sure: the mixing of the product of automobile factories and distilleries has created a serious situation in the past and probably will continue to do so. It might be a pious suggestion for the distillers, the automobile manufacturers, the insurance underwriters, and motor-vehicle officials to get together and try to devise some form of legislation which will remedy it.

It is doubtful if this chapter has proven very much except to demonstrate that it is the human element, the mental and physical equipment of human beings and their condition which must be brought under control and considered as the determining factors when granting the privilege of using the streets and highways. Until the attitude of the motoring public changes, the motor-vehicle accident rate will continue to increase unless some authority can and will act with such decision that drivers will make proper use of these roads and highways whether they like it or not.

CHAPTER IV

The Hazardous Home

SAFE at home!

What a hoary old time-honored superstition it is! Since the days when primitive man crawled into his cave, or climbed into his tree, the home has been a symbol of safety. Once home, he would be safe. Yet one third of the total number of fatal accidents occurring in the United States last year happened in and around the home, while it was responsible for more than 4,000,000 personal-injury accidents. Approximately 130,000 of these injuries were permanent in character.

If we accept the figure of 30,000,000 as the approximate number of families in the United States, one out of every seven or eight of them has one or more accidents during the year. Every year, one out of every thousand has a funeral due to some accident—which might have been avoided—in that presumably safest of all places, the home. Falls downstairs and falls upstairs—falls over rugs and off ladders—falls in and out of bathtubs—cuts, burns, ex-

plosions, asphyxiations, electrocutions, scalds, poisonings—broken heads and broken limbs—an army of people numbering more than eight times the population of the national capital tumbling about and sending for the doctor, or the undertaker, or both, not forgetting the claim adjuster of the insurance company.

Nearly one half of the fatalities in and about the home are due to falls, and the majority of these are falls on stairs or steps. According to figures of some insurance companies, the tricky rug comes next in order of responsibility, followed by walks, bathtubs, ladders, chairs, tables, windows, etc. Three fourths of these fatalities happen to persons over 65 years of age. Less than 10 per cent happen to children under 4 years of age, and about 17 per cent to children between 5 and 15 years of age.[1]

Burns, scalds, and explosions come next, accounting for 5,700 fatalities each year, and nearly one half of these happen to children under 14 years of age. Most of them are due to some act of carelessness or stupidity on the part of an adult, which seems almost incomprehensible in this day and age. There is still with us that classic example of pouring kerosene over live coals to start the fire in a hurry—a mother leaves a kettle of scalding water where a child can pull it over—a cook turns on the gas oven,

[1]For tables giving classification of accidents in and about the home by age groups and types, see Appendix G.

forgets it, and then attempts to light it when it is filled with gas—mother cleans a dress with gasoline and, as she passes a lighted gas stove, it catches fire—father rubs his ankle with alcohol while smoking a cigarette and burns off most of his pants—these actual cases and innumerable others have furnished material for both comic strips and obituary columns these many years. They are common types of acts of carelessness, absent-mindedness, and stupidity which are responsible for 800,000 home accidents each year, ranging in severity from a blister on a finger to death, and from a bit of scorched material to the complete destruction of the home.

Next we have asphyxiation and suffocation responsible for 2,100 deaths a year of which 800 happen to children under 4 years of age. A householder, leaving early, puts the coffee pot on the gas stove for the family, the flame blows out as he opens the door, and the entire family are asphyxiated. His next-door neighbor is adjusting his automobile, the garage door swings shut, and he is suffocated by carbon-monoxide gas. A most curious case is that of a man fixing a radio wire passing over a chimney—apparently he leaned directly over the flue, for he was overcome and was discovered lying across the chimney by neighbors.

A curious triple fatality due to "foul air" was recently reported in Brooklyn. The consumption of all the oxygen in a tightly sealed room

by a gas-burning stove wiped out a family of three—a man, his wife, and a 12-year-old boy.

Accidental poisoning provides about 1,600 funerals each year, while cuts and scratches, with infection following, provide 400 more. This latter classification gives us some 60,000 additional cases of infection, many of which result in amputations and serious illnesses of long duration. A mother pricks her finger while fixing baby's diaper and loses the finger—father cuts a corn with a safety razor blade and loses a foot. Cuts and scratches which seem relatively unimportant at the time take their toll in death and physical suffering every day and every year.

By location the kitchen seems to be by far the most dangerous place in the house. Thirty-four per cent of the accidents occurring inside the home happen here, most of them being, naturally, cuts, scratches, scalds, burns, explosions, etc. Next in line are stairs and halls, where 23 per cent of the home accidents happen, most of which are due to falls. The living room and basement account for 13 per cent each, and the remainder are scattered about in the bathroom, the bedrooms, the attic, etc. There seems to be some kind of a hazard lurking in every corner, and a study of home accident statistics brings the householder to the conclusion that he is quite as safe up in an airplane, in a powder factory, or down in a coal mine, as he is in his own home.

Why should the home be responsible for nearly one third the fatalities, more than one half the personal-injury accidents and an accidental economic loss which has been estimated at $550,000,000 a year? The answer is—bad home management. The home, after all, differs very little from the small industrial plant. It contains a certain amount of equipment for use in the business of creating comfort and convenience such as artificial lighting, heat, and the cooking of food. Proper use of this equipment secures a maximum amount of efficiency in the production of home comforts and convenience with the chances of accident reduced to a minimum, just as proper safeguards and habits of safety in an industrial establishment secure a maximum amount of efficiency of production with a minimum chance of accident.

When the attention of the average citizen is called to this appalling number of personal injury accidents in the home, his immediate thoughts turn to what he calls "the mechanization of the home." He has always thought of manufacturing establishments as the places where accidents are most likely to occur, and domestic labor-saving devices mean, to him, machinery in the home, and machinery means hazard.

As a matter of fact the home, from a mechanical point of view, should be much safer with our modern devices than in the "good old days"

of open fires, kerosene lamps, candles, and hot water carried from the top of the stove to wash-tubs. True, we still have open fires and candles, but more for decorative purpose than for utility, which fact largely eliminates the hazard in connection with them. Furthermore, they are used only occasionally.

Take, for example, the question of artificial light. The modern home, properly wired according to standard codes, provides practically no hazard either from fire or from the source of the light itself—electricity. It is quite true that there are, each year, just so many fires due to short circuits and just so many personal-injury accidents due to electrical shock. But these are due principally to bad management on the part of the householder. He has not taken the very simple precautions which would prevent these accidents from happening. Having taken these precautions, we have the facilities for the finest artificial light in the world and one which is far safer than oil lamps, candles, or even gas lighting. With gas one has not only the greater danger from fire but the danger from asphyxiation.

In so far as the kitchen is concerned, it can hardly be denied that the gas or electric range, properly handled, is safer than the old-fashioned wood or coal range. There is not only less danger of fire but also less danger of burns and scalds. Under normal conditions it is a fire which is

always out except when it is in actual use and therefore under direct supervision of the mistress of the kitchen.

Labor-saving devices—electric washing machines, mangles, vacuum cleaners, dish-washers, sewing machines, and what not—provide no hazards in themselves. Today, approved types are almost foolproof, and it requires but a minimum amount of intelligence to make use of them with a maximum amount of safety.[2] It is a safe assumption that the modern washing machine provides less opportunity for accident than the necessity, in the old days, of lifting great kettles of hot water from the coal or wood stove to the wooden washtub.

The central heating plant in the cellar, whether it be operated with coal, gas, or oil, certainly is safer than a half dozen open fireplaces or coal or wood stoves scattered throughout the house. We hear of fires caused by defective flues or chimneys, but how often do we hear of a fire which had its origin in the furnace, whether it be fired with oil, coal, or gas, in the cellar or in a steam or hot-water radiator?

Approved equipment of the modern home, properly used, adds to the safety of the home rather than to the hazards. Even if improperly used, it does not provide as many hazards as the equipment of the homes of our grandfathers.

[2]See Underwriters Laboratories, Chicago, Ill., for approved lists.

The whole problem of home safety is, as a matter of fact, very much the same sort of problem of the human factor as in the case of the motor vehicle or as in the case of a majority of industrial accidents. It is the human equation which must be solved. How can the average householder be persuaded that his home is not the safest place in the world any more than the motor vehicle is the safest form of transportation unless he himself exercises just a little common sense and a little care?

The problem of safety education in the home is a difficult one. Everyone resents being told how to run his or her home. The employer can force safety practices and carefulness in their work on his employees; the authorities can force the operator of a motor vehicle to drive conservatively or refuse him the use of the streets and highways; the Interstate Commerce Commission can command the railroads to adopt certain safety devices; school authorities can see that children in school are protected; but who is going to command the home owner to do this or prohibit him from doing that in his own home?

Before we approach the question of a means or a messenger with which to get this idea of safety into the home, there is always the question of the message itself: what kind of a program is the most effective for use in persuading the home owner that his home is not necessarily

"safe," that the accident problem in his and every other home is simply one of carelessness, and that his own attitude toward the entire matter should be one of annoyance at his own clumsiness and inefficiency if an accident occurs or even if hazards exist?

This question of a program for getting the idea of accident prevention into the home sounds simple enough, but, as a matter of fact, it is quite complex. It deals with people of all ranges of intelligence, from the lowest to the highest. One student of the question tells us that "real safety in the household consists mostly in an appropriate adjustment to a given situation rather than in detailed safety measures, and it would at times seem as if a complete integration of the safety thought with life activities might give the most effective results."

Probably the simplest program is the one which points out to the householder in a forceful way that in spite of the fact that he thinks he is perfectly safe in his own home, it actually contains scores of opportunities for minor and major personal-injury accidents, and then interests him in the idea of being his own inspector.[3] The big insurance companies—life, health, accident and fire—have done and are doing an enormous amount of effective work along these lines. For example, I have before me a personal

[3]For details of various programs for the prevention of accidents in the home see Appendix T.

address and telephone number book given out to its policy holders by a large life insurance company. It is attractively illustrated and extremely useful. Each right-hand page is given over to blank spaces for names, addresses and telephone numbers. On each left-hand page there is a brief message dealing with some particular type of accident in a few short paragraphs. One page deals with falls, another with burns and scalds, another with asphyxiation, and so on. They are the sort of messages one can read while waiting for a telephone connection.

The two center pages are given over to a series of 20 questions under the caption, "Be Your Own Home Inspector!" These questions are simple enough in themselves, but they serve a dual purpose: they call attention to at least twenty specific hazards or possible causes of accident in the home and suggest means of eliminating them. The whole booklet can be read in ten minutes, but it provides a basic program for accident prevention in the home.

Probably no institution in the United States has a better opportunity of reaching into the home with accident-prevention programs than the institution of insurance, unless it is the public schools. Almost every householder has some kind of an insurance policy—life, health, accident, fire, or automobile—except the very poor, and even they have landlords through whom they can be reached. There is scarcely a home

in the country which cannot be approached through insurance, whether it be the farmhouse or the city mansion. That the companies have appreciated this, that they have realized the importance of spending money on the education of the householder in home accident prevention, is witnessed by the enormous amount of literature on this subject which is published every year not only by the individual companies themselves but by such organizations as the National Bureau of Casualty & Surety Underwriters and the National Board of Fire Underwriters.

It is through the public schools, however, that the greatest opportunity of integrating this idea of safety into the activities of the home presents itself. As we will see in a succeeding chapter, what interests the child in school usually interests the adults in the child's home. The simplest devices, such as teaching a child to be a safety inspector of his own home, arouses his or her interest, and, in turn, arouses the interest of the parent.[4] Once the idea of accident prevention is inculcated in the minds of the adults, the battle is half won, and it only remains to finish the job.

Properly organized community safety movements must, of course, include the home, as we will see in a later chapter. It is one of the simplest methods of dramatizing the whole subject. To John Citizen safety drives mean the pre-

[4]For school programs for accident prevention in the home see Appendix T.

vention of motor-vehicle accidents—campaigns for conservative driving. It startles him to learn that for almost every automobile fatality there is a fatality due to some simple accident in the home, and for every personal-injury accident on the streets and highways there are four of them occurring in or about somebody's house. Once this fact is brought home to him, it is not too difficult a matter to interest him in the simple precautions which will prevent these accidents in "his castle."

Home management—this is the answer. Just as accidents in the factory are stupid and a reflection of inefficiency somewhere in the management, so are accidents in the home a reflection of inefficiency on the part of the home manager—the mother, or the father, or both. The only difference is that in the home we have the added factor of the young child who cannot be supposed to be able to absorb the idea of being "safety-conscious" and who must be trained and supervised until habits of safety become a matter of course. Until that time comes, the adults in the family must bear the full responsibility of personal-injury accidents happening to children in their own homes, and at the present time this means approximately 8,000 fatalities and 1,200,000 injuries each year.

CHAPTER V

The Toll of Industry

In 1926 Mr. Lewis A. DeBlois, at that time director of the Safety Engineering Division of the National Bureau of Casualty & Surety Underwriters and past president of the National Safety Council, wrote:

> The outstanding fact is the hugeness of the vital and economic waste from industrial accidents which, if to an appreciable extent avoidable, constitutes a national disgrace. Seven per cent of the 42,000,000 persons gainfully employed are injured each year, and the entire working population pays annually for industrial injuries a tax on its earnings which has been variously estimated at 2 to 4% ![1]

At that time the number of fatalities due to occupational accidents—I prefer the term "occupational" inasmuch as "industrial" is so often misinterpreted to mean manufacturing—was variously estimated as between 21,000 and 23,000. Mr. Carl Hookstadt of the U. S. Bureau

[1] *Industrial Safety Organization,* by Lewis A. DeBlois; McGraw-Hill Book Company.

of Labor Statistics, found that there were 2,453,418 occupational or industrial accidents in 1923, of which 21,232 resulted in death, 1,728 in permanent total disability, 105,629 in permanent partial disability, and 2,324,829 in temporary total disability. He calculated that this was equivalent to a loss of 227,169,970 working days, or $1,022,264,866 in wages.[2]

However, any estimate of the total number of fatalities due to occupational accidents prior to 1928 is unsatisfactory. For a number of years a figure of 23,000 was quoted without change, and higher figures were given prior to 1920. After the most careful calculations the National Safety Council has announced that the total number of such deaths was 19,000 in 1928, 20,000 in 1929, 19,000 in 1930, 17,500 in 1931, 15,000 in 1932, and 14,500 in 1933.[3] That this improvement is real and not simply due to the depression and unemployment is indicated by tables showing the death rates per 100,000 from occupational injury which show a steady decline from 45.7 in 1913 to 22.9 in 1932.

The two interesting features of these rather dry, statistical facts are: (1) the accident situation in industry is steadily and consistently improving, due largely to the organized safety

[2]Mr. Hookstadt used the American and Standard Accident Distribution Tables, to which he applied certain corrections of his own.

[3]For tables showing the distribution of occupational accidents among the various industries see Appendix H.

movement (as will be shown in a subsequent chapter) and, (2) while more than 40 million men, women, and children, or 32 per cent of our total population, are engaged in some gainful occupation, their occupations produce only about one half as many fatalities as the streets and highways and a little more than one half as many as are produced by the home. Industry realizes fully the great truth of the statement that "production without safety is inefficient," that accident prevention work pays cash dividends, and that regardless of humanitarian impulses there is absolute economic justification for intensified safety programs. And the end is, as Mr. P. B. Juhnke says:

> That the workman shall live to enjoy the fruits of his labor; that his mother shall have the comfort of his arm in her age; that his wife shall not be untimely a widow; that his children shall have a father, and that cripples and helpless wrecks who were once strong men shall not longer be a by-product of industry.

Cripples and helpless wrecks! In addition to the 14,500 deaths due to industrial accidents in 1933 there were approximately 1,200,000 nonfatal injuries, of which 45,000 resulted in *permanent total and partial disability*. The direct cost of claims, medical service, hospitalization, and funerals is estimated to be about $1,000,000,000. An analysis of some 75,000 personal-

injury industrial accidents to determine the economic loss due to slowing up of production, spoilage of materials and injury to machinery indicated very clearly that these costs are about four times the direct costs. This means that our industrial accidents are costing us about five billion dollars a year—twelve times the value of the property destroyed by fire each year, twice as much as we spent on our public-school system, one eighth of the net value of all our manufactures, and more than 10 per cent of the total national income.

Five billion dollars lost each year—14,500 deaths—45,000 permanent cripples and wrecks —more than a million other injuries—scores of thousands of widows, orphans, and other dependents—this is the annual toll of industry which, in spite of the marked improvement during the past few years, is, like the street and highway accident situation, a national disgrace.

There is no doubt that mechanization, with the consequent speeding up of industry, has a direct tendency to increase the *seriousness* of accidents, and that it has affected the whole accident situation in many ways, although some of the effects have been favorable. Machinery has often displaced handwork that was comparatively safe. The machine may accomplish the work with fewer accidents, but the "hazard per worker" is greater because of the smaller number of workers and the increased severity of

machine accidents. Furthermore, the tendency in industry is to increase the speed with which material goes through the processes of manufacture, which means that the exposure to accident is proportionately greater.

But here is the curious paradox: The chances of a wage earner's having an accident while working have steadily increased—the experts call it "the increase in the hazards of industry per man-hour"—and at the same time these chances in terms of production have decreased. In other words, it is much less dangerous to produce a barrel of flour, a pair of shoes, a sack of cement, an automobile, or a side of bacon than ever before. By measuring accidents in terms of things produced there are fewer accidents; but as we continue to produce more and more things, there are more accidents. As this sounds a bit involved, let us illustrate it with a simple example.

Suppose a shoe factory is producing a thousand pairs of shoes a day and has a hundred accidents a year. The proprietors change their methods of production, introduce new machinery, and speed things up so that they are making 2,000 pairs of shoes a day with the same number of employees, but they have 150 accidents a year. As a workmen's compensation risk for the insurance companies they are 50 per cent worse because they are having 50 more accidents a year with the same number of employees than

they have had heretofore. On the other hand, their record shows that their accident rate in terms of production is .075 accidents per pair of shoes where formerly it had been .100 per pair of shoes.

The question which immediately arises in the mind of the executive who is responsible for production and production costs is whether he shall consider his accident record from the standpoint of the fact that he is now producing a thousand pairs of shoes per day to 75 accidents per year when formerly they were costing 100 accidents, or, from the standpoint that his factory is now having 150 accidents per year where it only had 100 before? Is the well-being of people who work to be measured in terms of goods produced, or is it to be measured in terms of working conditions which, in the illustration just given, are 50 per cent worse in so far as the accident hazard is concerned?

All of which brings us right back to the question of the relationship between accidents and production efficiency. Shall industry continue to increase production per man hour regardless of the fact that the total *number* of accidents increases and then sit back complacently, pointing to the fact that they have decreased in terms of goods produced? Or isn't it possible to control accidents under modern industrial conditions regardless of "the increase in hazards per man hour"? Is the safe factory an efficient factory

(from the standpoint of production) or, to turn the phrase upside-down, is the efficient factory a safe factory? To answer this we must understand the relation between safety and production.

As long ago as 1919, Sidney J. Williams of the National Safety Council enunciated a statement of the relationship between safety and efficiency which will always remain a great classic. At a dinner given at the Engineers' Club in New York he said:

> Suppose a box falls off a loaded truck and kills a man. For every such case which results in a physical injury there will be perhaps a hundred cases where a box falls off, but without injuring anyone. But in every one of these hundred cases either the box will be broken or, in any case, the truck will have to be stopped and the load repiled. While, therefore, there will be only one case of physical injury, there will be a hundred and one cases of inefficiency. An accident is something gone wrong, and it can only result from causes which have their effect over a far wider field than that of the immediate accident itself. The physical injury is only the spectacular evidence of some underlying maladjustment in the same way that a headache is only an alarm bell that calls attention to something that is wrong within.

Any accident, whether it results in some physical injury or not, must cause some interruption in business, no matter what the nature of that business may be. As Mr. DeBlois has pointed out:

Most processes involve a long series of progressive steps or stages extending from raw materials in storage to the warehouse, shipping room, or freight car. An interruption anywhere in this chain may make itself felt all the way to both extremities. Not only is the final production proportionately decreased, but the flow of product in process is interfered with, difficulties are encountered which must be adjusted, and the whole operating schedule may be thrown out of joint. Even when the cause of the original interruption has been cured, full production cannot be instantly resumed. Meanwhile the fixed loss continues and must be paid for, production efficiency falls, and cost per unit of production bounds up, later to be reflected in the month's cost sheets.

Fifteen years ago, when this idea that safety and efficiency are linked together first began to impress itself on industry, the Simmons Company made some "common-sense changes" in the methods of feed and stock removal in a department operating 700 punch presses. During that year 36 fingers were taken off in accidents. During the first six months of 1920 only 7 fingers were lost. In the four years following, *not a single finger was lost and the production per press had increased on the average 60 to 65 per cent.* The Simmons Company makes the statement: "Our experience has been that whenever we made a job safe we also increased the production from 15 to 150 per cent."

One could go on multiplying examples of this kind almost indefinitely. Every man knows that he stands a greater chance of cutting himself with a dull razor than with a sharp one. Dull cutting tools, whether operated by hand or machine, not only will not do their work efficiently but are more dangerous than sharp tools. Henry Schreiber, deputy of the Industrial Commission of Wisconsin, has made the statement that changing wood-working saws when dull would reduce saw accidents 75 per cent and at the same time increase production, and this regardless of existing guards. Another source of combined waste and danger is in the use of improvised or improper tools.

For fifteen years the DuPont Company used presses for embossing fabrikoid requiring two men to operate and making 5 impressions a minute. When they had an accident the operator would lose practically an entire hand. Improvements which included the installation of certain types of guards were made which increased the operating speed to 9 per minute and later permitted the operation with one man per press. Further developments increased safety and permitted one man to operate two presses. Through these changes accidents were eliminated, labor reduced 75 per cent, and production per press increased 80 per cent.

There is also an important psychological factor involved in the introduction of accident

prevention devices and general safety programs in any kind of industrial work. A good example of this is found in the construction of a concrete surge chamber 40 feet in diameter by 160 feet deep in connection with the Moccasin Power Plant of the Hetch Hetchy project in California.[4] After the concrete had reached a height of 80 feet it was decided to stretch a life net between the walls of the chamber to save the life of any workman so absent-minded as to fall from the top and to provide protection for the men below from falling timbers. Because of the added sense of security afforded the workmen, all operations in connection with the concrete lining were speeding up, which resulted in an actual saving in labor cost of nearly 20 per cent.

Since it is true that one can go on multiplying examples of this kind until it can be proved, beyond argument, that safety in industry means fewer fatalities, fewer cripples and increased efficiency, how can there be any hesitancy about the introduction of the newest and most improved devices to prevent accidents or methods of operation for the same purpose. Mr. DeBlois has answered this question much more effectively than I can. He says:

It is true that many eminent industrial executives have declared themselves satisfied with the results of safety work in their plants if one employee has

[4]Report of the California Industrial Accident Commission.

been saved from accidental death, but there are others whose actions are less profoundly influenced by their emotions, whose sense of obligation to society is less keen, and many who, though feeling the humanitarian impulses, seek some measure of economic justification before embarking upon a campaign of intensified accident prevention.

The more prominent industrial executives do not own their own business; they are but the paid servants of their stockholders and must, theoretically at least, furnish an accounting of their stewardship. On the other hand, executives of small industrial concerns (which include 70 per cent of the country's industrial establishment), who are frequently owners or part owners, have comparatively slender reserves on which to draw for "new improvements" and, in addition, must meet the exigencies of close competition. Merely to tell such men that "safety is a good thing" is quite insufficient—indeed, they know it already. They must be shown that safety is an investment that will not only carry itself but will yield a reasonable return.[5]

And so it goes. There is indisputable evidence that well organized accident prevention work has been successful in thousands of scattered and diverse industrial enterprises, and that industrial accidents can be controlled under modern conditions of intensive production. The evidence that this work can be made to pay for itself in actual savings—will actually pay cash dividends—is just as indisputable. To the work-

[5] *Industrial Safety Organization,* by Lewis A. DeBlois.

man it means the prevention of a tragedy—to the company involved the saving of money and increased efficiency. An automobile company saves enough in one year to build 30 additional trucks. The savings by one railroad represents the gross passenger revenue from 82 16-section pullman cars filled with passengers and operated for 1,000 miles. Nineteen thousand milk cans are the equivalent of the annual saving through the reduction of lost-time accidents in a Milwaukee plant. A paper company saves enough in one year to make a strip of paper 6 feet wide and over 50,000 miles long. As the American Engineering Council said five years ago in a report which fills a volume of 400 pages: "Material reductions in accident rates can be obtained simultaneously with an increase in production rates," and, "maximum productivity is ordinarily secured only when the accident performance tends toward the irreducible minimum."

Safety in industry means a great deal more than the mere mechanical safeguarding of machinery. It is a fairly safe assumption that not more than 15 per cent of this class of accidents are mechanically preventable. These are only the obvious hazards for which guards may be easily designed. What is more important and infinitely more interesting are those factors in industry which are related to the worker himself, his conduct, and his habits. Careless prac-

tices are the major cause of occupational accidents, and to eliminate them requires an entire change in the mental attitude of the worker—this means that safety must be a definite and integral part of supervision.

For example, there is a definite relationship between the health of a worker and his chances of having an accident. The healthy man is less likely to meet with an accident than one who is ill with some chronic disease. Furthermore, the health of a man is intimately related to labor turnover, and the more frequent the turnover, the more frequently do accidents occur, for it is a well-known fact that it is during the breaking-in period that accidents are most likely to be encountered.

And so the problem of industrial accidents resolves itself into a very simple equation of which the factors are efficiency in production, working conditions, and an organized safety program integrated into the entire production plan. Industry itself has already a splendid record for accident prevention work, but it is not enough. As the Committee on Safety and Production of the American Engineering Council, commenting on the significance of its own elaborate report, says:

Industry is admirably efficient, its achievements are a source of justifiable national pride, but its processes must be freed from inexcusable human

wastage. Its operation must no longer accumulate a preventable cost in human lives and curtailed energies. When these losses and costs have been eliminated or brought down to the irreducible minimum, then and then only will the highest productivity be secured and the most efficient operation realized. The dynamic force which can attain this highly desired objective resides in the management. Therefore, a responsibility which cannot be evaded rests upon the managers and executives of industry to make safety a major interest and a continuing care.[6]

"What part does the employer play in the work of getting rid of accidents?" asks the National Bureau of Casualty & Surety Underwriters, to which it replies:

He plays the leading rôle. It is he that decides whether his plant shall be safe or unsafe, whether it shall be efficient with a low workmen's compensation cost or the opposite. The choice is essentially an executive cost. If the employer wishes to operate on a basis of safety and efficiency, the means are at hand. There are two factors that produce industrial accidents, one, the existence of physical and mechanical hazards, two, the unsafe acts of employees. Both factors can be controlled by management. It is management that buys the machinery, tools, appliances, and other equipment, that authorizes expenditures for design, installation, use,

[6]For full information regarding methods and procedure for making an industrial plant "safe," address the National Bureau of Casualty and Surety Underwriters, the National Board of Fire Underwriters, the National Safety Council, or any large insurance company.

maintenance, repairs and replacement of equipment and that is in direct control of space, light, ventilation, housekeeping methods, and the other physical conditions in plants. Management has the legal and moral responsibility for providing safe working conditions. Eighty per cent of industrial accidents occur, however, because of the unsafe acts of employees. Here too management must accept responsibility. It is management that selects, instructs, and trains the workers, that assigns them to their tasks, that supervises the performance of their work and that has both the right and ability to require compliance with instructions. "Management" implies ability and responsibility in the handling of men. Management can and management only can make a safe plant. An industrial executive has recently stated in public that "astonishing results can actually be achieved at a nominal cost if management backs prevention work with determination and enthusiasm. It is possible to eliminate lost-time accidents almost entirely."

But, until these lost-time accidents are reduced, the premium rates for compensation insurance cannot be reduced—in fact, as we will see in the next chapter, there is a tendency to interpret and administer the compensation laws in most of the states so as to broaden their scope to such an extent that these insurance costs may be greatly increased in the near future thus adding to the burden of the manufacturer and consequently to the ultimate consumer of the products of industry.

CHAPTER VI

Occupational Diseases

WHILE it might seem that there is no direct connection between "occupational diseases"[1] and the accident severity or frequency rate in industry, they are beginning to constitute a serious menace to the whole system of benefits paid to injured workmen under compulsory insurance laws, because the administration and interpretation of these laws are being stretched far beyond their original intent. The result is that they are adding heavily to the cost of this form of insurance and in some instances making it difficult or even impossible for employers to obtain it. This means increased cost of production and consequently increased cost to the ultimate consumer of the products of industry.

Therefore, they have a very definite place in the economic picture of the industrial accident situation. While the number of accidents and total hours lost have been declining—thanks to safety work—the claims paid on workmen's

[1]Any disease arising out of and in the course of employment which is of gradual onset.

compensation have been growing rapidly,[2] and if this continues it can mean only one thing: rapidly increasing premium rates which in some industries may become a burden too heavy for them to carry and in others a burden passed on to the consumer.

The original theory of workmen's compensation laws was to provide definite compensation for workmen injured by accidents caused by the hazards of the particular occupation. If a structural steel worker is injured by a fall while working on the construction of a building, it is a hazard peculiar to the occupation of a structural steel worker. Industry readily admits that he is entitled to compensation and coöperates with officials in administering the benefits of the law. The same thing is true of any type of accident which would not have happened to the worker at that particular time had he not been engaged in his particular occupation.

It must not be forgotten, however, that the cost of this compensation must be passed on to the ultimate consumer. It is a part of the operating cost of operation of any industry or commercial enterprise. It does not matter whether the employer, because of financial strength, is allowed to carry his own insurance or whether he buys insurance—this cost is borne, ultimately, by the purchaser of the product from

[2]"Workmen's Compensation a Fast Growing Racket," by P. W. Gumaer, writing in *Chemical Markets*.

his retail dealer, for it is reflected in the retail price. Any unreasonable broadening of workmen's compensation laws to include all sorts of diseases which may or may not have some connection with the occupation affects the whole economic situation of industrial accidents from the manufacturer's and consumer's point of view.

To illustrate this, let us return to our structural steel worker. Suppose he catches pneumonia while at work. Pneumonia is, after all, the result of a hazard to which all persons are exposed whatever their occupation may be, or even if they have no occupation. Had the structural steel worker been unemployed he might have been sitting on a park bench, and if susceptible to pneumonia at that particular time have caught it just the same.

Compensation under the compensation laws in such a case is nothing more or less than free life and health insurance. Whatever its merits—in many instances employers do furnish free life insurance—it should not be allowed to masquerade under the cloak of compulsory accident compensation laws. Yet in some states these laws are being interpreted in such a way that the word "injury" means not only accidental injury but any injury to the health of workmen arising in the course of employment whether employment-connected or not.

For example, in New York a salesman, while

on the road, with his meals being paid for by his employer, contracted typhoid fever eating lunch in a restaurant where a typhoid carrier was employed. It was held that the disease was an "accidental injury" arising out of and in the course of employment.[3]

Another traveling salesman was so unfortunate as to get stuck in a mud hole while on his way to business. He got out of his automobile, was bitten by an infected wood tick, contracted mountain fever, and died. The courts held that the injury was by accident arising out of and in the course of employment.[4] An actor sprains his ankle tripping over a spear. Later an infected finger had to be amputated. He was awarded compensation for the loss of the finger on the theory that the infection traveled to the finger from the sprained ankle through the blood stream.[5] A watchman dies of erysipelas and pneumonia, and his widow is awarded death benefits on the theory that he bumped his knee in the engine room ten days before.[6] Just a racket, encouraged, consciously or unconsciously, by courts and commissions.

But while these exceptional cases of curious and illogical interpretations of the compensa-

[3]Johnson vs. Smith (New York Appellate Division).

[4]Roe vs. Boise Grocery Co. (Idaho Supreme Court).

[5]Wilson vs. Philadelphia Theatre Association (N. Y. Appellate Division).

[6]Woodman vs. Fur Co. (N. Y. Appellate Division).

tion laws are interesting and sometimes utterly ridiculous, it is a more or less obscure disease known as "silicosis" that is causing executives of insurance companies writing compensation insurance to lie awake nights. Difficult of diagnosis, slowly cumulative over a long period of years, not necessarily fatal of itself, it is being brought within the scope of the compensation insurance laws in such a way that it is rapidly becoming an unknown and highly dangerous factor in the rate structure.

Silicosis is a disease of the lungs caused by the inhalation of dust high in minute ultra-microscopic particles of free silica. Eventually these particles find their way to the roots of the lungs, blocking the lymph glands and causing the gradual formation of a tough, fibrous tissue. The development of this tissue is very slow, the time in which it begins to cause serious damage normally varying from 3 to 25 years. In the earlier stages it cannot be detected by physical examination, and the worker shows no symptoms. In fact, it may not provoke symptoms during the worker's life.

The only way that silicosis, which causes the worker to be particularly susceptible to such diseases as tuberculosis and pneumonia, can be detected is by means of the X-ray, and even with the X-ray its diagnosis is difficult, requiring a highly trained technician to interpret the pictures.

However, it is not the new risk which is bothering the insurance underwriters so much: it is the old risk which the company has been carrying for years, and in which, perhaps, a large number of workers have been suffering from silicosis in various stages of development. As the scope of the workmen's compensation laws is broadened to include this disease as an "accident" for which compensation must be paid, they are faced with an accumulated potential loss of unknown proportions. This means that they must readjust their rates—perhaps by guesswork—to cover, if possible, this future but unknown loss, or cancel the policy, which may mean bankruptcy for the enterprise if new insurance cannot be obtained.

Because of the necessity for this readjustment, the company can demand that all workers subject to this hazard be X-rayed. It is one thing to make such a demand and quite another thing to get the workers to submit to an examination. Definite proof of the existence of silicosis may cost them their jobs or force their transfer to another department. Furthermore, once it is definitely determined that a worker has silicosis, he is in a position to put in a claim.

In the making of these readjustments of premium rates it may very well happen that they will reach a point where the burden will be too heavy for industry, particularly small industries, to bear. Naturally, the ultimate consumer

of those commodities produced by industries where the "silica hazard" exists pays the bill because the overhead cost of insurance is included in the cost of production. Thus we find a new type of industrial hazard being classified as "occupational diseases" and adding to the economic loss caused by the accident situation as a whole.

Already attempts have been made to turn this new knowledge of silicosis into a "racket." In the case of a small concern in the Middle West employing 42 men, no less than 41 suits were filed in a single day by the same lawyer, the claims ranging from $10,000 to $35,000. Judgments mean bankruptcy. In another case $7,000,000 worth of claims have been filed. It seems like a road to easy money, but fortunately state labor officials, as well as industrial employers, recognize the injustice of such procedure, and steps are rapidly taken to nip all such schemes in the bud, sometimes to the great inconvenience of the class of doctors and lawyers known as ambulance chasers.

Insurance companies and industry have combined and are spending hundreds of thousands of dollars to eliminate this industrial hazard known as silicosis. It is a technical engineering problem, and engineers have found the answer. Inspectors visit industrial plants and take samples of the air. These are analyzed for the number of dust particles per cubic foot—an

actual dust count is made—and in this way the "concentration" of silica dust is determined. There is a definite maximum below which the air may be said to be fairly safe from the standpoint of health. If the concentration exceeds this maximum, something must be done about it.

The matter is immediately taken up with the employer. It is very much to his interest to have his plant as "safe" as possible both from the standpoint of accidents and from the standpoint of the health of the workers. The problem in this instance is to prevent the dust from entering the workers' lungs.

There is no method by which all dust may be removed from the air, and there is no mechanical contrivance in the form of a respirator, which the workers will wear, which will filter dust from the air without rapidly clogging. An effective method of removing these fine, invisible particles is by suction applied as close as possible to the point where they are generated. Exhaust pipes, open at the point where the tool is doing the work or where the dust is being generated and with an amount of suction which will overcome the dispersing action of the dust, are efficient.[7] Even more effective is the pressure air line respirator. Other measures are the use of vacuum cleaners instead of brooms, proper surfacing of floors and walls, etc.

[7]See *"Dust Hazards and the Prevention of Injury from the Same,"* by W. Irving Clark, M. D.

As a result of these preventive measures, developed almost entirely by the research divisions of the engineering departments of the great insurance companies, the transition in the modern foundry or other processing enterprise involving this form of hazard is interesting. It can be compared to the transition of the old-fashioned cow barn to the cow barn of the modern dairy farm, which almost resembles a drawing room with lace curtains and everything. There is little or no excuse for the development of silicosis in the future—the problem of industry and insurance remains with the accrued liability coming out of the past like a specter threatening both.

Next in importance, from the point of view of both industry and insurance, is lead poisoning. This can be caused by inhalation or by swallowing, but the lead which reaches the lungs is more injurious than that which is swallowed. Possible absorption through the skin is so slight as to be almost negligible, except when tetraethyl lead is involved. However, lead furnishes a very high percentage of the cases of so-called industrial poisoning, the cause being twofold; first, lead is now used in some 150 different trades and is finding new applications in the rapidly changing field of industrial chemistry;[8] and second, many employers and workmen fail

[8]For a list of the more important sources of lead exposure see Appendix I.

to appreciate the insidious character of lead poisoning.

Like silicosis, lead poisoning is a cumulative disease and is usually due to the constant entry of minute particles of lead or its compounds into the system, where it accumulates until there is a sufficient quantity to cause some of the symptoms of poisoning. The most effective method of combating it in any industry is by the elimination of lead and its compounds whenever this can be done without lowering the quality of the product. Another is by shop preventive measures, which include engineering principles and apparatus designed to protect the worker from exposure. A third method is by personal hygiene —insistence that the worker observe specific rules.[9] The engineering and inspection departments have done a great deal of splendid work along these lines.

One could continue almost indefinitely discussing industrial or occupational diseases and the work which has been and is being done to eliminate them. There are anthrax, transmitted from the skin, hide, hair, wool, or bristles of domestic animals affected with it; benzol poisoning, caused by inhaling benzol fumes; carbon-monoxide poisoning, chrome poisoning, mercury poisoning, radium poisoning—to mention a few more of them. The important point is that the original purpose of workmen's compen-

[9]For rules see Appendix J.

sation laws has been progressively altered in the United States by amendment, administration, and interpretation in the courts until today the employer is rapidly becoming the indirect insurer of the lives, health, and earnings of his workmen.[10] Without entering into the merits of these forms of insurance they are not workmen's compensation insurance and their costs whether direct or indirect should not be chargeable to the accident situation in industry.

Compensation insurance losses as a per cent of the payroll index are rapidly increasing while the trend of lost time accidents is steadily downward.[11] As a percentage of the total premium income—the loss ratio—they offer direct evidence that the workmen's compensation risk is becoming uninsurable. For the stock companies it was 83% in 1931; 82.9% in 1932; and 84.3% in 1933. Only approximately 15% left with which to pay commissions, for engineering and inspection; overhead and other costs of doing business. According to insurance authorities if these losses continue to increase there is a mathematical certainty that disaster lies ahead. As P. W. Gumaer has stated in *Chemical Markets* for December, 1933:

If the extension of workmen's compensation to provide relief for misfortunes other than injuries

[10]"Workmen's Compensation a Fast Growing Racket," by P. W. Gumaer, *Chemical Markets* for December, 1933.

[11]For chart see Appendix K.

for which industry is actually responsible is not stopped and a breakdown occurs in the system of compensation payments the chief sufferers will not be the employers or the insurance companies but the injured employees and their dependents who legitimately are entitled to benefits under the compensation law.

CHAPTER VII

Transportation

(Other Than Motor Vehicles But Including Taxicabs)

"IF I COULD write the history of the wheel I would have written the history of civilization."[1]

The three great milestones in man's progress are the discovery of the art of making fire, the invention of the wheel, and the invention of the alphabet. But if we are seeking the direction of all progress, both physical and psychological, we must seek for it in the economic growth of methods whereby man moves from one place to another. If the satisfaction of that all-consuming passion, that desire when we are in one place to get to some other place and get there as quickly as possible, is in the direction of progress, and if progress is synonymous with civilization, then we can agree that a history of the wheel is a history of civilization—transportation, as we understand it, means the wheel.

According to the record, about one of the safest places in the world is on a railroad train.

[1] *Pegasus,* by J. F. C. Fuller.

Safety in railroad transportation has become a byword, a condition so commonplace that the news of a major railroad accident startles us and makes front-page news for days. In the public mind the phrase "railroad accident" is associated almost entirely with a grade-crossing accident involving either a motor vehicle or a pedestrian. Out of the 5,019 fatalities due to railroad operation in 1933 only 218 were the result of what can be properly classified as "train accidents."

During this same year the railroads killed 50 passengers.[2] Of these 50 passengers, however, 12 were not on trains at the time of the accident. Fourteen passengers on trains were fatally injured as a result of collisions and nine were killed as a result of derailment of trains. The other 15 were killed in various types of accidents such as slipping or falling while getting on or off cars and the like. Railroading has become an exact science.[3]

More than one fourth—1,511, to be exact—of these so-called "railroad fatalities" were due to collisions between trains and motor vehicles. An absurd feature in connection with this class of accident (if one can use the word "absurd" in connection with a fatality) is that at least 20 per cent of them were due to a motor vehicle run-

[2]A passenger is any person who has purchased a ticket and is on railroad property for the purpose of making use of it.

[3]For tables classifying railroad fatalities see Appendix L.

ning into the side of a train and not due to a train crashing into an automobile. The grade-crossing accident where the railroad is entirely at fault is very rare—in almost every instance they are due to the carelessness, recklessness, or stupidity of some motor-vehicle driver or pedestrian.

However, the public is becoming more and more insistent that grade crossings be eliminated. But in spite of all that the railroads can do to respond to this public demand, grade crossings are increasing in the United States rather than decreasing. In seven years the railroads eliminated 10,341 of these crossings yet, during that same time, the total number increased from 233,701 to 237,035. This increase is due, in a large measure, to the construction of new streets and highways.

Grade-crossing elimination presents a very serious economic problem which the railroads themselves are financially unable to meet, and never will be able to meet without the help of communities and states. Taking New York State as an example, the average cost of eliminating a grade crossing in this state during the last 15 years was about $72,000. Applying this figure to the country as a whole, it would take no less than $17,000,000,000 to wipe out all crossings at grade, which is about 2/3 of the total value of all existing railroad property, and a sum far, far beyond the reach of the railroad industry.

Naturally, one may say that $17,000,000,000 is not too big a price to pay for something which will save nearly 1,500 lives a year, and theoretically this is true. On the other hand, it is a vast sum of money to spend to save people from stupidity and carelessness—the kind of stupidity which, if it does not lead to grade-crossing accidents, would probably lead to some other kind of an accident. For example, an 8-hour survey at 302 grade crossings showed that no less than 143 drivers of school buses, loaded with children, failed to stop at grade crossings before proceeding across the tracks—an action which should have resulted in the revocation of 143 bus drivers' licenses.

The splendid record of the railroads, which have reduced railroad fatalities from nearly 11,000 a year to about 5,000 a year in the past 20 years, is due to the fact that almost from the very beginning of railroad operation executives have studied and worked over the problem of safety and accident prevention. In 1830, more than a century ago, at the official opening of the first railroad system (the Manchester & Liverpool Railroad) Mr. William Huskisson, an eminent member of Parliament, was killed by the historic *Rocket,* the ancestor of the steam locomotive of today. George Stephenson, inventor of the *Rocket,* sensed at that time that this fatality was but the forerunner of a multitude that would follow—the price to be paid for speed in trans-

portation. Railroad pioneers were developing accident prevention as they developed our great railroad systems, and as long ago as 1879 Charles Francis Adams, Jr., wrote:

> Not without reason, therefore, has it been asserted that viewing at once the speed, the certainty and the safety with which the intricate movement of modern life is carried on, there is no more creditable monument to human care, human skill and human foresight than the statistics of railroad accidents.

The record of the railroads for accident prevention among their employees has been quite as good as the passenger record. In the year 1918 there were 3,048 employees killed or died of injuries and 149,469 injured. These totals were steadily reduced, year by year, until 1933 produced a record, according to the Interstate Commerce Commission, of only 500 employees killed and 15,583 injured. That these tremendous savings in life and personal injury pay dividends in a material way is shown by the records of the Interstate Commerce Commission. During the ten-year period ending 1930 there was a cumulative saving in personal-injury expense of $160,884,105, comparing the year-by-year expense with the amount expended during the last year of the previous decade. When the other items of expense—clearing wrecks, damage to property and freight—are taken into account, the cumu-

lative saving for this ten-year period amounts to the astounding total of $1,139,505,282.[4]

From the bell cord and the steam whistle, which were perhaps the first safety devices to be adopted by railroads, to automatic train control—the history of railroading is a history of the application of the principle of regulation from within. The automatic coupler, the protected vestibule, the air brake, block signals, interlocks, steel equipment, better bridges, guard rails, heavier track rails, ballast, and tie plates—these and a host of other devices have given the American people the finest railroads in the world with the safest methods of operation. Because of improvement in operating methods it is estimated that approximately 6,000 fatalities and 90,000 injuries due to collisions alone have been saved during the past 20 years by the reduction in the number of collisions.[5]

Street-railway officials tell us that their major problem is safe operation—made so largely by the motor vehicle, which is a major contributor to their difficulties. Congested thoroughfares have slowed up running time, caused costly delays, and multiplied collision accidents in both frequency and severity. Furthermore, the competition of the automobile and the bus in the

[4]From a paper on Safe Transportation from a Somewhat Historical Viewpoint by Lew R. Palmer.

[5]For tables giving in detail casualties to employees on duty per million man hours Class I Steam Railroads, see Appendix M.

transportation field has provided new sales problems for the street-car operator, making it necessary to redesign equipment to afford greater comfort and convenience and to readjust schedules.

Surveys and analyses of street-car accidents over long periods of time seem to indicate that only a comparatively small group of motormen are involved in a large percentage of all accidents reported, although operating under identical conditions as larger groups of trainmen having excellent accident records. This seems to confirm the statement made frequently by psychologists and psychiatrists that *accidents do not distribute themselves by chance, but that they happen frequently to some men and infrequently to others as a logical result of circumstances.*[6]

So it would seem that there are certain points of similarity between the operation of a street car and the operation of a motor vehicle, even though the one is confined to tracks and the other can wander all over the road. The human element is the important factor in the accident situation. There is a definite class of individuals who because of certain mental, physical, or psychological defects fail to control a situation leading to an accident when it arises. This is called "accident-proneness" and among the pri-

[6]See *The Accident-Prone Employee,* a study of electric railway operation undertaken by the Cleveland Railway Company.

mary causes of this accident proneness are faulty attitude, failure to recognize potential hazards, faulty judgment of speed or distance, impulsiveness, irresponsibility, inattention, nervousness, and fear.[7]

There is another form of transportation which the public rarely thinks of as transportation—it is vertical. More people travel vertically by means of elevators than can be found riding on our railroads, trolley cars, subways, and elevated trains all put together. In fact, as Marshall L. Oliver, writing in *Safety Education* for November, 1933, says: "We should be safe if we included airplanes and baby-carriages as well." Without the modern electric elevator there could be no skyscrapers, housing 25 or 30 thousand workers, and great cities like New York could never have been built in restricted areas. Modern horizontal transportation has made it possible for these multitudes of workers to scatter out into the suburbs, where living conditions are superior to those in the city, but without modern vertical transportation there would have been no such communities providing employment for literally millions.

Prior to 1852 comparatively few buildings stood more than four or five stories high. Then Elisha Otis invented the first "Otis Safety Elevator." This was equipped with a powerful

[7]For chart showing the percentage distribution of the primary causes of accident-proneness among motormen, see Appendix N.

spring which was released in case the hoisting rope broke, and by catching in cogs located at the sides of the shaft acted as a brake to prevent the car from falling. It was far from safe, but the first step had been taken in the direction of making it safe for human use.[8]

From this time on steady progress was made, devices and improvements being added, one by one, until we have the elevator as we know it today. Probably the biggest single step which was taken was when electricity began to be adopted as the motive power. It is electricity which makes possible the so-called "automatic elevator," where the operator simply pushes various buttons representing the floors at which he wishes to stop. The elevator stops at exactly the right level of each floor for which the button is pressed. The doors open automatically and the elevator cannot start again until the doors are fully closed. To Mr. J. F. Sprague, with his unwavering faith in the electric motor, must go much of the credit for its development and for the electrification of vertical as well as horizontal transportation.

Other important steps in the advance of elevator safety were the development and improvement of the car safety and the hoistway door interlock. The car safety is a remarkable device which prevents the elevator car from falling to

[8]See "When We Travel Vertically," by Marshal L. Oliver, *Safety Education,* November, 1933.

the bottom of the hoistway in the event that all the hoisting cables break. The early forms of this device stopped the car instantaneously by clamping solidly onto the guide rails. On modern installations, safeties of the friction clamp type bring the car to a gradual stop in case the cables break. The hoistway door interlock prevents the door from opening while the car is away from the landing and prevents the elevator from operating while the hoistway door is open. Installation of interlocks has prevented innumerable falls through open hoistway entrances, and accidents of many other types.

Like the railroad train the modern elevator is entitled to be called "one of the safest places in the world." It may be said that there can be no such thing as an elevator accident per se, with the modern elevator—that is an accident due to the falling of the elevator with consequent injury to passengers. Such elevator accidents as we hear of today are due to improperly guarded elevator shafts in industrial plants, failure to provide effective hoistway door interlocks, car gates with electric contacts, and other necessary devices.

The taxicab[9] presents a dual problem. It is a motor vehicle, and at the same time it is a vehicle for commercial passenger transportation in competition with street cars, subways, elevated

[9]See "Preventing Taxicab Accidents," a report of a survey conducted by the National Taxicab Owners Association.

roads, and buses. The taxicab driver is essentially a cruiser, constantly on the lookout for business, and competing with other taxicab drivers for choice locations where the chance for fares seems best.

We often hear it said that the average taxicab operator is the safest driver in the world. Is this true? A report of the Motor Vehicle Bureau of the State of New York seems to indicate that it is not. It shows that 5 per cent of the motor vehicles involved in fatal accidents were taxicabs, and 60.7 per cent were private cars. This is a ratio of approximately 12 to 1. But, taking the United States as a whole, there are 331 private automobiles to every taxicab, which indicates that the fatality frequency of the taxicab is far greater than that of the private motor vehicle.[10]

Elaborate surveys show that nearly 70 per cent of all taxicab accidents are due to collisions with private cars. There are comparatively few collisions with other cabs, pedestrians, or street cars. An interesting feature of these taxicab accidents is that there are 3 times as many of them in dry weather as in wet weather, and another is that single taxicab drivers with no dependents have twice as many accidents as those who are married and have dependents.

Because he is not only driving a motor vehi-

[10]Exposure, however, is a factor. The average taxicab covers many more miles than the average private car in a year.

cle, but because he is engaged in transporting passengers, and because the manner in which he secures these passengers or fares must, necessarily, distract his attention from driving, the licensing of a taxicab driver is a matter of extreme importance to the public. Some method should be devised for controlling his hours of work (this is done by organized taxicab companies), for fatigue is a great contributor to accident frequency. The applicant's antecedents, his habits, experience, and general physical and mental characteristics should be thoroughly investigated. As in all other forms of transportation, the human element is of far greater importance than the equipment. Like the private motor vehicle, the modern taxicab is a product of the highest engineering skill.

Just thirty years ago today (it so happens that this chapter is being written on December 17, 1933) Orville and Wilbur Wright launched their pusher biplane from a starting rail on the sands of Kitty Hawk, N. C., and kept it aloft for twelve seconds. This was the first flight in a heavier-than-air machine although it had been prophesied by Leonardo da Vinci as long ago as the latter part of the fifteenth century. Commenting on Leonardo's work in artificial flight, the late John Lieb said:

> In no other direction has he shown such a combination of the extraordinary powers he possessed

of scientific research, acute observation and mechanical ingenuity. Without the internal combustion motor we have today, aviation would be just about where he left it, with the possible exception of the work done on gliders by Chanute and Lilienthal.

Air transportation is the latest response to the spirit of the age—the demand for speed and still more speed. Three hundred miles an hour in the air is no longer news. That it is rapidly taking its place on the list of *safe* methods of transportation is shown by its record of the past few years.

The trends of aviation deaths are best interpreted in terms of the amount of flying. The chief point of interest is that from the middle of 1930 the rate for *non-scheduled* flying has been at least four times as high as that for *scheduled* flying. In 1933 the non-scheduled rate was over eight times as high as the scheduled rate. The number of fatalities for scheduled flying was 28 while for non-scheduled flying such as student instruction, experimental, miscellaneous commercial, and miscellaneous pleasure, it was 310. Of the 28 killed in schedule flying 9 were pilots, 8 were passengers and 11 are listed as "others."

From January, 1928, to December, 1933, investigations were made by the Aeronautics Branch of the U. S. Department of Commerce of 655 scheduled air transport accidents. It is interesting to note that 296 or approximately

46% were due to landing (not forced) accident, take-off accident and taxiing accident. Only 32 were due to fires in the air or structural failures. Forced landings accounted for 192, collisions, spins and stalls 88, and miscellaneous, undetermined or doubtful, 37.

Speed!—speed in transportation, and more and more speed! This is the constant demand of the American people. It took our forefathers many months to cross the continent or the Atlantic Ocean. Today our air transport lines advertise "From Coast to Coast in 20 Hours," and we are told that the day is not far distant when we shall cross the Atlantic in a day. But with these incredible speeds developed by the railroads, the automobile manufacturers, and the air lines, we also demand safety—it looks as though we were getting it.

CHAPTER VIII

Fire!

IN THE previous chapter the statement was made that the three great milestones in man's progress are the discovery of the art of making fire, the invention of the wheel and the invention of the alphabet.

One of the earliest myths in the story of Creation is the account of Prometheus and its implication that the acquisition of fire established for all time the superiority of man over animals. Prometheus, it will be remembered, managed to get into heaven and, lighting a torch at the chariot of the Sun, returned and presented fire to man, thereby giving him dominion over all the earth. Fire contained the germ from which has developed our civilization as we know it today.

Without fire there could be no such thing as modern industry or, in fact, industry of any kind. Construction would be confined to rude huts of stone and wood or mud; and even though man might accomplish something which would resemble, in a remote way, the modern

home, it would be of no value except in temperate or tropical areas, for it could not be heated and would serve only as shelter from the elements and animals. Even the Eskimo in his igloo has fire. Man might have devised some rude method of spinning and weaving, but this would be his closest approach to the textile industry of today. Food, clothing and shelter would still remain that of the most primitive days, while transportation and communications would be accomplished only by the methods of the wilderness.[1]

But fire is, perhaps, the most curious paradox in all of the forces of nature. Man's greatest friend, the foundation of all of his cultural development, it is also his greatest enemy. By his intelligence he has made fire his greatest of all servants, bent it to his will. By his stupidity and carelessness he has permitted it to master him only too often, spreading death and disaster day in and day out like some great plague beyond the comprehension or control of medical science.

During the latter part of the last century it was frequently stated that there was only one fireproof building in the city of New York, and that stood on the southwest corner of Fifth Avenue and Forty-second Street—the location of the present Public Library. A curious investigator would find that the "fire-proof building

[1]See *Prometheus, U. S. A.;* Harper & Brothers.

consisted of the Reservoir impounding 24,000,000 gallons of water." It is a question as to whether New York has a completely fire-resistive building today. In fact, there can never be a completely fireproof building.

Fire prevention, on any important scale, is a development of the present century. Prior to 1900 fire was regarded as a thing to be fought, not prevented, and attention was concentrated upon the equipping and training of fire departments, which, in America, with their constant opportunities for service, became famous for speed, skill, and daring. Figuratively speaking, the American fire alarm is never silent. With an average of more than a fire a minute, night and day, 365 days in the year it is chattering continuously.[2]

Calling attention to the multiplicity of ways in which fires are caused, Mr. Harry Chase Brearley, in his book *A Symbol of Safety,* quotes an unnamed author as saying:

"Fire possibilities exist on every hand; they are found in the most unthought of places. It is natural to associate fire hazard with a box of matches, but who would look for it in a glass of water? Yet potassium or sodium thrown into water bursts at once into flames, while a few drops of water on gray, rock-like calcium carbide produces acetylene gas. Many fires have been caused by water. Fire is continually originating in the most unexpected ways

[2] *A Symbol of Safety,* by Harry Chase Brearley.

—by the spark from an accidental hammer blow in a room containing gasoline fumes, even by the well meant action of a hospital nurse in oiling the body of a live-steam victim and covering him with blankets—in this case spontaneous combustion cost the life of the patient.

"Invention is a constant hazard; new devices and processes are continually producing elements of the greatest danger. The versatile but highly inflammable celluloid is a case in point. There is also a lacquer used in shoe manufacturing and known to the trade as 'dope'; it is prepared from celluloid scrap and its use in a wooden shed was the starting point of the thirteen million dollar Salem conflagration in 1914. The giant new industry of moving pictures was not generally supposed to be hazardous until disastrous fires and serious loss of life resulted from it. There is a well recognized fire hazard in incubators, in curling irons, in raincoat manufacture, in various polishing, cleaning and sweeping compounds, and in countless other products and processes.

"With the daily use of fire for purposes of cooking, lighting, heating, commerce, industry, art, science or pleasure by almost every individual in every community; with sparks borne by the winds from smoke-stacks and chimneys; with barns and houses burned by lightning; with the omnipresent commercial electricity always ready to transform itself into fire through some defect in transmission, and with fire hazard lurking unseen in the incessant stream of devices emanating from the busy brains of inventors, there can be small wonder that ap-

palling destruction marks the pathway of man's most useful servant."

When the outline of this book was under discussion the question arose as to whether fire had any proper place in it or not. Presumably the story of accidents, could fire be placed in the same category, as street and highway, industrial, transportation or any other similar form of catastrophe resulting in loss of life, limb, or property values? Should it not be considered as something more or less out of the control of man —a natural force which, when it caused some catastrophe, should be considered as something which had to be, which could not be helped?

This, of course, is quite in accord with a statement made in a previous chapter, that "there is no such thing as an accident except those incidents which are the result of some great force in nature over which we have no control as, for example, lightning or a tornado." Otherwise, we have maintained that accidents do not happen—they are caused.

On the other hand, most of our destructive fires are not due to some great force over which we have no control, such as lightning or an earthquake, but are due entirely to man's carelessness in the manner in which he makes use of fire. It becomes an accident as it is defined for the purposes of this discussion in that it is something which did not just happen but was caused.

Due to the invention of matches, 600,000 torches of Prometheus are lit in these United States every minute of the 24 hours of the day and any one of them can bring about the destruction of a home, factory or a life—just as one legend tells us that the torch of Prometheus first brought about the destruction of the world. The match is one of the most valuable and at the same time one of the most dangerous articles made by man.

When the President suggested to Congress that he would like to increase the public debt by $10,000,000,000 in order to promote his plans for economic recovery folks gasped and wanted to know who would pay the bill—the interest on this vast sum alone becomes a heavy burden on the taxpayer, who is the government's only source of revenue. Yet the actual cash loss due to fire each year in this country is a modest interest on this colossal sum. In 1932 this loss amounted to more than $450,000,000—4½ per cent interest on $10,000,000,000 and $10,000,000,000 would pay the President's salary and the entire expense of the Executive Office from the Declaration of Independence up to the present time.

This actual cash loss—the equivalent of the loss due to the complete destruction of a city of more than 80,000 urban homes housing nearly half a million people—by no means represents the total economic loss or even the major proportion of it. There are the so-called intangibles

—the interruptions to business, the loss of employment, the costs which accompany the loss of "use and occupancy" of dwellings and all sorts of buildings as well as the continuing losses to the family because of the death or injury of human beings. Of all of the industrial buildings which were burned during the past five years it is said that 43 per cent failed to rebuild or resume operations. This means that the people employed in those buildings had to seek employment elsewhere or join the great army of the unemployed and become either directly or indirectly public charges.

Ten thousand men, women, and children are burned to death each year in "accidental" fires. Two thirds of these lose their lives in residential fires of which there is one every 4 minutes of the 24 hours. One third of them are children under 10 years of age. And most of these fatalities are due to rank carelessness.

At the head of the list of man-made devices contributing to fires caused by carelessness we find "matches." Early in his career man learned to make fire by friction. The friction match of today, which is but a little over one hundred years old, is probably the greatest contributor to the 1,500 accidental fires which occur every day in the year in these United States.

There is no such thing as a "safety" match from the standpoint of the fire hazard. The term was originally meant to refer only to

their safeness in so far as poisoning is concerned. Once a match is lit, there is always the danger of its staying lit after it is discarded. So many fires started by matches are due to the carelessness of smokers that the Actuarial Bureau of the National Board of Fire Underwriters has combined the hazard under the twin designation "Matches—Smoking" and today this hazard leads all other causes in its responsibility for fire destruction, with a total annual charge against it approximating the huge sum of $35,217,800 in 1931.

These fires are caused almost entirely by carelessness in discarding matches. The wife of Henry Wadsworth Longfellow was burned to death because she carelessly threw a lighted match upon the floor, and similar fatalities are numerous. This suggests a story of an officer of the Northwestern Mounted Police, told to the author by an official of the National Safety Council.

This officer was seated in the lounge of a modern fire-resistive hotel in a large Northwestern city. The floor was tiled, and there were ash trays on standards at every chair. He lit a cigarette, blew out the match, and then broke it in two before discarding it. After he had done this three or four times his companion's curiosity was aroused, and he inquired just why the officer always broke a match before throwing it away.

"Did I do that?" was the questioning reply. "If I did, I was not conscious of it. It happens, however, that that is one of the first laws of the Force. Never throw a match away without breaking it in two. Then you know it is out. Forest fires, you know."[3]

Barring war, fire has been the most destructive element in modern life. When it gets beyond control, as it so often does, it sweeps from building to building until a whole section or several sections of a city are reduced to ruins. These great conflagrations seem to recur from time to time in various parts of the country, and no city is immune. As far back as 2,000 B.C., Sodom and Gomorrah are supposed to have been destroyed by fire. Troy was razed by fire in 1184 B.C., and prior to the beginning of the Christian Era Rome suffered six great fires. In 1666 the Great London Fire occurred, which made more than 200,000 people homeless. This catastrophe has additional importance, since it resulted in the birth of modern fire insurance as a means of protection against loss by burning.[4]

On April 18, 1906, there occurred the world's "worst" fire—San Francisco, with a property loss amounting to $350,000,000. Some San Franciscans claim that this great catas-

[3]For simple precautions in the use of matches see Appendix O.

[4]For a discussion of the history of great conflagrations see *Safeguarding the Nation Against Fire,* published by the National Board of Fire Underwriters, New York City.

trophe was not a fire, because, as they say, there would have been no fire if there had been no earthquake, and that therefore it was an earthquake and not a fire.

It is quite true that had there been no earthquake the conflagration which followed would not have occurred *at that time*. But the city was doomed to be visited by such a fire, and the earthquake only hastened matters. Six months before engineers of the National Board of Fire Underwriters had reported that the city was in imminent danger of a conflagration, and their warning was amply justified by the subsequent disaster, which in less than a day obliterated the work of fifty years.[5] This single conflagration cost the members of the National Board every dollar of underwriting profit they had made since 1860 plus $80,000,000 besides. Two hundred and fifty blocks containing 250,000 buildings, including many in the finest portions of the city, were razed by the flames. How much of this might have been saved if the city authorities had heeded the warning of the engineers and been prepared for just such an event? Discussing this great fire, the National Board of Fire Underwriters says:

In the case of San Francisco an accident deprived the city of its fire chief and handicapped the fight

[5] *Safeguarding the Nation Against Fire,* National Board of Fire Underwriters, New York.

from the start, but the true reason for the rapid spread of the flames was the character of the buildings involved. The quake scattered boiler fires and household fires, and the live coals ignited combustible materials, but the flames would in all likelihood have been extinguished had structural conditions been favorable. The earth's tremors burst the large main supplying most of the city's water, but there were a number of private artesian wells which probably would have been sufficient to stem the tide of destruction had the city been *less inflammable*.[6]

Heedless smokers, continually striking matches and discarding them, have been responsible for many terrible fires in which there has been heavy loss of life. Notable examples are a shirtwaist factory in New York wherein 145 lives were sacrificed; a hotel holocaust in the same city which caused 45 deaths; a Binghamton, N. Y., clothing factory fire in which there were 35 fatalities. The most expensive cigarette on record is one that caused a $2,000,000 warehouse fire in Jersey City, N. J. It destroyed four storage buildings, several neighboring properties, twenty railroad locomotives, and a number of loaded freight cars.

Next in importance as causes of fire loss are defective chimneys and flues which cost us between $25,000,000 and $26,000,000 a year. Then follow stoves, furnaces, boilers and their pipes, between $18,000,000 and $19,000,000 a year;

[6]For summary of reasons for conflagrations see Appendix P.

spontaneous combustion, about $14,000,000; sparks on roofs, $14,000,000: the human element, carelessness, entirely to blame.

According to the insurance actuaries, electricity causes an annual fire loss of approximately $17,000,000, due to defective wiring and the misuse of heating appliances of various kinds, including electric irons, toasters, hair curlers, hot plates, heaters, etc. When properly employed, electricity is the safest form of light, heat, and power, but when hooked up with such things as amateur installations, unsafe pieces of lamp cord, extensions looped around nails, and fuses replaced with pennies or doctored so that they are no longer fusible, it becomes one of the chief fire hazards.

One could go on and on listing the known causes of fires and always come back to that fundamental cause—carelessness. Hot ashes; coals; open fires; natural and artificial gas; the misuse of electricity, explosions, chimney soot, bonfires, rubbish, faulty construction, lack of the simplest safeguards—these and a host of others are blamed for destructive fires, but as in the case of every other type of accident we continue to return to the human factor—ignorance, stupidity, carelessness, or all three. Like every other type of accident which is under discussion in this book—they do not happen: they are caused.

The economic aspects of fire destruction, en-

tirely apart from loss of life and personal injury, are both interesting and important. The average annual fire loss for each man, woman, and child in the United States is $3.68. In France it is 45 cents; in Italy, 37 cents; and in England, 79 cents. Our national fire waste not only constitutes an ever present danger to life and property but has reached the proportions of an economic burden. The destruction is properly termed "waste" because it always results in the loss of time, labor, and materials (burned property can never be restored) and is largely preventable.

These economic aspects of fire destruction are discussed at length in *Safeguarding the Nation Against Fire,*[7] Chapter VII. It is well worth reading. It can be shown that the losses for which fire is responsible may be avoided by the exercise of reasonable care. Instead of that we prefer to add to our fire departments, which is exactly like employing more and more doctors to suppress an epidemic without attempting to remove the cause of the sickness.

[7]National Board of Fire Underwriters, New York.

CHAPTER IX

Who Pays?

TEN BILLION DOLLARS!

It's a lot of money, even if President Roosevelt did tell Congress that it is exactly the sum he must have as nonchalantly as a mother informing her husband at the breakfast table that Jimmie would have to have a new pair of shoes. It is approximately one fifth of the whole national income—one fourth of the total value of the manufactures of the United States—five times as much as we spend each year on our public schools, a sum entirely beyond the comprehension of the average mind, which means that it is beyond the comprehension of most of us.

Yet this is the price in dollars we pay each year for carelessness, stupidity, indifference, or whatever it is that permits accident frequency and accident severity to march steadily on year after year. Twenty-seven million dollars a day, over one million dollars an hour, nearly $19,000 a minute! Years ago there was much talk about an "Elimination of Waste" program, yet here is

a stupendous annual economic waste which, disregarding the grief caused by a hundred thousand funerals, the mutilations, the hundreds of thousands tossing, pain-racked, on their beds, the permanently disabled cripples, is a great national disgrace because so much of it is easily avoidable.

When the President announced his $10,000,000,000 budget program, carrying with it the implication that the budget for the next succeeding fiscal year would be almost the same, everybody gasped. Only a few appreciated what this might mean for future generations of taxpayers, for money spent by the government, no matter how or where obtained, must be paid, eventually, by the people. Foreign governments borrowed vast sums from us with which to conduct the World War, and we curse them for not paying it back, failing, apparently, to realize that the only way they can get that money is to take it out of the hides of their citizens, and this is no easier in France, England, Germany, or any other country than it is in our own in times of depression. It is easy enough to balance a budget by laying down a tax and building the budget on expectancy, but it is quite another thing to collect those taxes when people have no money to pay.

The attitude of the average citizen toward the national economic waste involved in the accident situation is much the same as his attitude

toward National, state, or city budgets—and toward taxes. If his income is sufficiently modest to enable him to avoid sending a check every three months to the Bureau of Internal Revenue; if he owns no real estate; if his small savings are invested in tax-free bonds; if he never has to step up to a tax collector's window; budgets and tax rates do not interest him. Let the government spenders go as far as they like—the rich must pay, and he has some compensation for being comparatively poor.

He does not realize that every time he turns an electric switch on the wall; steps on the starter of his automobile; buys a new suit of clothes; sits down to the table; or gives a dime to a panhandler, a score of government tax collectors are hovering around to get their bit of that expenditure. Somewhere between 27 per cent and 30 per cent of what he spends to keep himself and his family alive—clothe them, feed them, house them, and educate them—goes to the upkeep of government. Every time a government employee draws down a pay check; or an official demands a new rug or hires a new clerk; or some agency decides to build a road, a tool shed, or a great public building, he must chip in his share whether he likes it or not, and he does so whether he knows it or not.

And so it is with accidents. Our citizen may never carry a dollar's worth of life, health, accident, or fire insurance; he may not own an

automobile; it may be a matter of indifference to him whether the house in which he lives burns down or not as long as he isn't in it when it happens; he may never have or be involved in an accident at any time—yet, whether he believes it or not, he must contribute something to the cost of every accident that happens in these United States. These accidents, eating up one fifth of our total national income, add just that much to the aggregate cost of living, and this cost comes out of the pockets of every man, woman, and child in the United States. A hundred thousand people may die and be buried each year because of them, hundreds of thousands may be permanently disabled, and a few million suffer temporary personal injury, but the cost in dollars and cents, like the expenditures of our governmental agencies, is borne by the people as a whole, and there is no way they can get away from it.

We have seen that the accident bill for industry alone is $5,000,000,000 a year. Is it possible that our average citizen thinks that this bill is paid by industry? On the contrary, that $5,000,000,000 is added to the bill rendered the ultimate consumer for the commodities produced by industry just as surely as the taxes paid by the manufacturer, the transportation agency, the wholesaler, and the retailer are added to the final retail price cost paid by John Citizen. The farmer loses a hand in a threshing machine; a

dropped casting kills a workman in a foundry or machine shop; a lineman is electrocuted; and the cost is reflected in the cost of a loaf of bread, an automobile, or a kilowatt hour of electricity. No person can escape paying his share of this $5,000,000,000 tax which accidents impose on every commodity produced and sold any more than he or she can escape paying his share of the $10,000,000,000 tax imposed by Mr. Roosevelt's budget. As Mr. Lew R. Palmer has said: "We all pay for them. The injured person pays, the family pays, the community pays, the industry pays. Everybody pays."

It is quite true that industry as a whole protects itself whenever and wherever possible against excessive losses due to accidents by purchasing workmen's compensation insurance, which it is compelled to do by law in most states. But this simply means that the entire cost of industrial accidents is ultimately paid by industry by paying the premiums which cover the cost of the services rendered by the insurance companies and the losses paid by them. At the risk of being accused of constant repetition, these costs must be added to the cost of production and are ultimately reflected in the retail price to the consumer. Thus it is actually the American people as a whole who pay the cost of industrial accidents.

But the manufacturer can not protect himself against the intangible and uninsurable losses—

the slowing up of production which always accompanies any accident, spoilage of materials or tools, and the time lost in bringing the department in which the accident occurs back to normal operation. This, as we have seen, is four times the cost of medical attendance, loss in wages and overhead cost of insurance, and, as in the case of the insurance premium, must be included in the cost of production. Accidents may cost American industry $5,000,000,000, but that sum is added to the bill paid by the public for the products of industry—it is just so much added to the cost of living.

According to the records of the Interstate Commerce Commission "personal-injury expense" has cost the railroads during the past ten years millions of dollars. But who pays the freight? The public that eats, wears, uses, and utilizes the billions of tons of freight transported. Who buys the railroad tickets? Again the public, and as this personal-injury expense is a part of the cost of operating railroads, it must be reflected not only in freight rates but in passenger fares. The same thing is true of every other form of transportation, whether it be the electric railways, marine, airplanes, or buses. The cost of transportation accidents is borne by the general public just as surely as the taxes paid by transportation are, in the last analysis, paid by the general public, even though it may never take a ride of any kind.

We have a universal servant—electricity. Every kilowatt hour of electrical energy that is generated and distributed must carry its share of the burden caused by the cost of accidents, to be passed on to the ultimate consumer. It may be an accident in the mines that produces the ore from which the iron, steel, or copper going into generating and distributing equipment is made—in the manufacturing establishment manufacturing that equipment or facilities for the utilization of electricity—in the generating plant or on the distributing lines—all of them contribute to the cost of electric service and are duly registered by the meter in the cellar, the store, or the factory.

Even the farmer is not immune. In the price of whatever he buys, whether it be farm machinery or clothes—seed or fertilizer—electricity or stock—is included his share of the national accident bill and this passed on to the consumer of food products. In addition there are about 4,000 fatalities and 80,000 major or minor personal-injury accidents occurring to the productive labor on the farm, and the cost of these must be included in the cost of wheat, bacon, potatoes, or eggs.

The cost of every automobile accident, every accident in the home, every fire, turns up in one way or another in the general cost of living. True, the injured person may be said to be the greatest sufferer, but in many cases the heavier

burden or cost rests upon his family. In addition, the community as a whole must share in the cost; institutional expense such as the maintenance of hospitals, to say nothing of at least a portion of the expense of such institutions as police, fire, inspection, and health departments, which are a part of every well organized community.

Just as the workman contributes one day out of every four of his labor to the cost of government—one fourth of every dollar he receives and spends goes to pay a great variety of taxes—so does he contribute some portion of the other three days to the cost of accidents. He not only pays when he himself is involved in an accident but in one way or another he pays his share of the cost of every other accident—pays when he buys the family groceries, pays the rent, uses gas or electricity, shovels coal into the furnace, buys shoes for his children or an overcoat for himself. Every person engaged in a painful occupation contributes to this staggering economic loss of $10,000,000,000 a year or one fifth of the total national income.

Suppose by waving some magical wand we could cut the total number of fatal and non-fatal personal-injury accidents each year, thus saving at least $5,000,000,000. How many houses could be built and owned; how many automobiles could be bought; how much insurance could be carried; how many students sent

to school and college; how much product added to industry through reduced labor turnover, with attending reduction in price and commodities which, again, would stimulate increased purchasing and a demand for further production?

Leaders of finance, business, and industry shook their heads dubiously when the President announced his $10,000,000,000 program for this fiscal year and asked one another when, where and how the bills were going to be paid. They knew that the money must come, eventually, out of the pockets of the American people, but would the American pocketbook stand it? Yet, with a pathetically few exceptions, they seem to look with equanimity on the $10,000,000,000 program handed to us by Old Man Accident each year, although they must surely know that the money comes from exactly the same source as that which supplies our political leaders with the funds for their vast expenditures. The banker, the industrialist, or the public official who refuses to take part, enthusiastically, in any organized accident prevention program is exactly like the manufacturer who throws valuable materials on the scrapheap when they could be turned into by-products which would reduce his cost of production—in fact, he is immeasurably worse, for he ignores not only the economic values but human values.

Part II

The Answer

Interlude

INTERLUDE

The Organized Safety Movement

IF ONE were to write a history of "safety," one would have to begin with prehistoric man, who had to defend himself against cold, hunger, wild beasts, and even against his fellow man. He was, at best, a terror-driven, ignorant savage, this ancient ancestor of ours, facing a hostile world peopled with unseen terrors. Injured by accident, he crawled to his cave or into the brush to die, unless he was killed by animals or some other and stronger man.

Primitive man, however, met dangers which were inevitable. They existed through no fault of his and had to be met with whatever means nature may have provided him. Today we are meeting dangers which are preventable—hence the so-called "safety movement," which may be said to have been born in 1844, when the British Parliament adopted Lord Ashley's "Great Factory Act," requiring, among other provisions, the protection of moving machinery.

Working conditions in American industrial establishments probably were never as bad as

they were in England during the early part of Queen Victoria's reign, but the accident situation was worse and continues to be so. We were a nation of hardy pioneers, accustomed to risks and to taking chances as well as quite intolerant of rules and restrictions. Cheap immigrant labor was plentiful, but these immigrants were as unfamiliar with industrial hazards as native Americans leaving the farms to work in the factories.

Accidents were frequent and, as the factories grew and more and more machinery was installed, the accident situation grew worse. Steel mills were called "slaughter houses," and it was a common saying that a man must be killed for every mile of railroad track laid. Everybody felt that accidents were bound to occur as a natural by-product of our industrial activities—*it was the price we paid for progress.* The conception of "accident prevention," as we know it, did not occur to our grandfathers and great-grandfathers.

In 1877 the state of Massachusetts enacted a law to compel employers to safeguard dangerous machinery, and during the next thirty years many progressive industrial states enacted similar laws. These earlier laws were full of loopholes, however, and too often there was no means of enforcing them. The insurance companies, from the very beginning, did pioneer work in urging employers whom they insured to provide safer working conditions, but they were in a

difficult position, due to the fact that they were often called upon to defend in court the very conditions they were desirous of improving. They lacked the incentive obtained through imposing a definite responsibility upon employers which would awaken their interest and lead them toward accident prevention work. It was not until 1898, when the state of New York adopted the first workmen's compensation bill, that this incentive was provided, and with it the beginnings of what is known as the "organized" safety movement.

It has often been said that insurance is not a cure for the condition which it covers. The possession of a life insurance policy will not provide the holder with immortality any more than an accident policy will prevent him from breaking a leg or an old age pension prevent people from growing old. In the case of workmen's compensation legislation, however, there has come into existence a form of insurance which *has* been instrumental in preventing accidents. This is due to the fact that the law places a definite responsibility for accidents on the employer, who immediately shifts it to the insurance company, thus giving insurance the opportunity to devise plans for coöperating with the employer in an effort to eliminate dangerous conditions.

Before the coming of workmen's compensation legislation—today only four states are

without this type of law—an injured workman had very little chance under employer's liability. The employer's liability laws were based on the assumption that when a man took a job he assumed the risks attached to it. It was assumed that the ordinary hazards of the work were obvious and that his employer had warned him of any extra-hazardous conditions. The employer was expected to provide reasonably safe working conditions, that is, a safe factory, equipment, and employees in so far as he could be expected to regulate them.

When sued for damages by an injured workman, he or his insurance company could fall back on three major defenses. These were that the injured party had assumed the risks; that the accident had been due to a fellow worker whose actions he could not be expected to control; and that the injured man, himself, had been guilty of contributory negligence. These defenses, coupled with the burden of proof and the cost of legal actions, made it almost impossible for the injured employee to recover. If he did, his lawyer got most of it, and his dependents, in the event of death or permanent disability, were usually left destitute.

The principle of workmen's compensation brushes aside the whole question of negligence and deals with the general accident situation in a broad way. There is no haggling over who was to blame—the burden of compensating the

victims of accidents or their dependents must be borne by industry. There is no complicated legal procedure, for workmen's compensation differs essentially from employer's liability in that it places a definite and fixed financial responsibility on the employer regardless of circumstances.

It has often been said that compulsory workmen's compensation laws and the discussion which attended their introduction and enactment first awakened public interest in accident prevention—an interest which has spread far beyond the bounds of industry, employers and employees, and now extends over every human activity under any and all circumstances. The implication is that no one was thinking very much about organized safety programs in industry or transportation prior to this type of legislation, which is not true. As early as the late 80's or the early 90's leading industrialists and railroad operators were telling one another that "safety must be the first consideration" and by 1900 many industries had well-developed accident prevention programs and had made considerable progress in the work of conservation of human life.

What workmen's compensation legislation did do, however, was to give the great insurance companies an opportunity to come out publicly for safety and actively promote it as a great conservation movement without the danger of

having their motives misunderstood. They were quick to grasp it, and the rapid progress of the safety movement during the past twenty-five years has been due, in a very large measure, to them and their executives in charge of this work.

It should be noted, however, that the invention and development of devices to prevent accidents antedates safety organization and safety education. George Westinghouse and his air brake made possible steam and electric transportation as we know it today but, what is more important, this one commercial device has been responsible for the saving of innumerable lives.

It required not only inventive genius but indomitable will and purpose to insure recognition and application of the air brake.[1] When Westinghouse endeavored to interest Commodore Vanderbilt, head of the New York Central System, in his device, Vanderbilt asked: "Do you mean to tell me that you propose to stop a railroad train running at full speed with nothing but air?" Westinghouse replied, "Just that." Vanderbilt turned to his secretary and said, "Show this lunatic out and never let him trouble me again." In 1886, a 50-car train thundering down a grade was stopped within a distance of 600 feet by "nothing but air."

[1]See "History of the Safety Movement," by Lew R. Palmer; *Annals of the American Academy of Political and Social Science.*

To "Father" (Lorenzo A.) Coffin, known to comparatively few, goes the credit for the first federal law requiring safety appliances on railroads. Coffin, as a state railroad commissioner of Iowa, made it his business to investigate accidents to railroad men rather than to passengers, and found that the greater number were killed by falling from cars and that the next greater number were killed in coupling cars. He conducted an untiring campaign which resulted in a recommendation by the Interstate Commerce Commission that a law be adopted requiring automatic couplers and air brakes. Coffin had a bill already drafted which was introduced in Congress. After a four-year fight, with Coffin on the job every day, the bill was passed and signed by President Harrison on March 3, 1893. It was not so very long after this that the railroads began to organize their employees for a part in the war against accidents.

From the best information available it would seem that as an industry iron and steel can be justly credited with the first comprehensive effort to organize an entire industry, beginning as early as 1900, to develop accident prevention in its many plants, the Illinois Steel Company apparently being the pioneer. In 1906 Judge Gary issued his historic instructions: "The United States Steel Corporation expects its subsidiary companies to make every effort prac-

ticable to prevent injury to its employees. Expenditures necessary for such purposes will be authorized. Nothing which will add to the protection of the workmen should be neglected." Since that time more than 40,000 men have been saved from serious and fatal injury in the operations of these various subsidiaries, and in a ten-year period more than 250,000 men were saved from injury causing the loss of more than one day's time. The reduced casualty expense has more than balanced the added cost incident to safety.[2]

Attention first centered on safety devices and other mechanical means of protection, and in 1907 there was held the first public exhibition of these devices in the American Museum of Natural History and under the auspices of the American Institute of Social Science. This was the first adaptation of the exhibit method of education in safety—an importation from Europe. From this display grew the American Museum of Safety, which has done much splendid work under the direction of Mr. Arthur Williams, its present president.

In this same year (1907) the Association of Iron and Steel Electrical Engineers was formed, and, because of the introduction of electricity into the steel industry and the hazards it created, the Association appointed a Safety Committee—the first to be established by any

[2]See "History of the Safety Movement," by Lew R. Palmer.

association in the United States.[3] Accident prevention grew in importance as a topic for discussion at its annual conventions, until finally, in 1911, it was decided to hold a larger and more widely representative conference at which safety should be the sole topic for discussion. Out of the many isolated efforts to reduce accidents there had come, at last, a realization of the need for coördination of activities looking toward a nation-wide, efficient dissemination of safety principles.

The invitations for such a conference were sent out by Lew R. Palmer, chairman of the Safety Committee of the Association of Iron and Steel Electrical Engineers (now conservation engineer of the Equitable Life Assurance Society of the United States) and the "First Co-operative Safety Congress" was held in Milwaukee in 1912. At this time the president of the A. I. & S. E. E. appointed a committee for the purpose of forming a permanent "National Organization for the promotion of safety to human life." In its report to the parent body this committee advised that "your committee will undertake to act as a National Council for Industrial Safety, adding to its number from time to time representatives of such other bodies as concern themselves with its problems." It further advised that "the Council *has* organized by

[3]See "How the Safety Movement Began," by Louis DeBlois; *Safety Education*, March and April, 1931.

electing the following officers: [The birthday of the N. S. C. is October 5, 1912]

"*Chairman:* Fred C. Schwedtman, National Association of Manufacturers; *Vice-Chairman:* Lew R. Palmer, Iron and Steel Electrical Engineers; *Acting Secretary:* Lucian W. Chaney, U. S. Bureau of Labor."

Thus was launched a national institution that was carried on through two annual safety congresses by voluntary effort. Starting with sixteen men and no money, it has become the most powerful organization in the world devoting its time and resources solely to accident prevention.

However, the organized safety movement cannot be said to have been started at any one time, or at any one place, or by any one group. There have been a multitude of independent pioneers: insurance companies and their executives; factories and their executives; mines; railroads; state and federal bureaus, and a host of others. Among the outstanding organizations who have labored in this field are the National Association of Manufacturers, the American Red Cross, the National Bureau of Casualty & Surety Underwriters, the National Board of Fire Underwriters, the American Railway Association, the National Automobile Chamber of Commerce, the Chamber of Commerce of the United States, the Boy Scouts of America, the

Girl Scouts of America, the American Automobile Association, the American Legion, to say nothing of thousands of state and local associations, clubs, etc. The safety movement is a product of the times. Wars come and wars go, but accidents go on forever taking a toll far greater than any war. In the succeeding chapters we shall see what is being done by the many interests devoting their time to the war on accidents and what they propose to do in the future.

CHAPTER X

The National Safety Council

IN OCTOBER, 1913, there appeared on the door of modest offices in the Continental and Commercial Bank Building, Chicago, the words "National Council for Industrial Safety." The new enterprise had a president, R. W. Campbell, a managing director, W. H. Cameron, and two stenographers. Its total assets were forty members, unbounded enthusiasm, and a lot of determination. Yet in spite of this unpretentious start the Chicago *Tribune* immediately prophesied that these newly established headquarters would become "one of the most important offices in the world"—a prophecy which was more than conservative in view of the events of the past twenty years.

For it was at this time that what is now known as the National Safety Council, the recognized leader of the organized safety movement, was definitely established, an activity which has saved or prolonged the lives of hundreds of thousands of people during the past two decades. Supported by American business and industry, insurance

and transportation, with more than 4,000 members, it has become a great coöperative activity which has but a single aim—the conservation of lives and the elimination of avoidable accidents.

The story of the National Safety Council is, to quote Mr. T. A. Burke, "one of revolutionary achievement that follows the law of progressive development. Humanitarian forces declared war on indifference, prejudice, ignorance, selfishness, and precedent. Hearts clashed with minds." On every side the waste in human lives and human suffering due to unnecessary and entirely stupid accidents was constantly growing—humanity's junk pile representing a form of inefficiency entirely out of keeping with the claim that we are the most efficient nation in the world.

We have seen in a preceding chapter that the organized safety movement actually had its beginnings in industrial accident prevention. But, prior to 1907, there was little thought about safety, even in industry, except in certain companies controlled by executives of uncommon foresight. There was no particular incentive for such thought because the legal loopholes, "contributory negligence," "assumption of risk," and the "fellow servant doctrine" gave little inspiration for safety organization. Employers knew little of the economic loss occasioned by accidents. So, if and when they had to pay, they simply marked the charge off on the books as

an unavoidable element of production. A workman lost was just so much stock waste, like the left-over from the power press, or the shavings from the planer.

In 1907 and 1908 the government took a hand. Compensation laws were passed in many states, and suddenly industry awakened to the fact that accidents were costing money. About this time President Taft put into force safety measures for a large group of federal employees. This, of course, had a wholesome effect upon the public, and it wasn't long before many industrialists and others settled down for a little serious contemplation about accident causes and remedies.

As referred to in a previous chapter, the Association of Iron and Steel Electrical Engineers was formed in 1907 and is credited as the first national organization in the United States to appoint a safety committee. It is safe to say that Mr. Lew R. Palmer, who eventually became its first chairman, little realized when recommending the appointment of this committee the historical significance that would in later years be attached to its formation; or that the First Cooperative Safety Congress called by the Association of Iron and Steel Electrical Engineers was in reality the launching of a movement that, within little more than a decade, would encircle the globe; for it can be truthfully said today that the sun never sets on the members of the National Safety Council.

At Milwaukee the president of the Association of Iron and Steel Electrical Engineers, Mr. B. R. Shover, Electrical Engineer of the Gary Plant of the Illinois Steel Company, presented a resolution drafted by Mr. Gano Dunn, Past-President of the American Institute of Electrical Engineers, and then Chief Engineer of the Crocker-Wheel Company. This resolution was passed by the joint session of the Association of Iron & Steel Electrical Engineers and the First Coöperative Safety Congress, authorizing President Shover to appoint a committee of organization "to take the first steps toward the formation of a National Organization for the promotion of safety to human life" (see Resolution in Appendix). This committee included the following:

Committee Appointed

Dr. Chas. P. Neill, U. S. Commissioner of Labor.
Dr. Joseph A. Holmes, Director, Bureau of Mines.
Chas. C. McChord, Interstate Commerce Commission.
F. W. Houk, Commissioner of Labor, Minnesota.
Dr. L. W. Chaney, Department of Commerce and Labor.
H. M. Wilson, Bureau of Mines.
Dr. M. J. Shields, National Red Cross.
C. W. Price, Wisconsin Industrial Commission.
James T. McCleary, Iron & Steel Institute.

John Kirby, Jr., National Association of Manufacturers.
R. C. Richards, Chicago and North Western Railway.
C. L. Close, U. S. Steel Corporation Safety Committee.
F. C. Schwedtman, National Association of Manufacturers.
David Van Schaack, Aetna Life Insurance Company.
R. J. Young, Illinois Steel Company.
L. R. Palmer, Association of Iron & Steel Electrical Engineers.

The organization of the National Council for Industrial Safety[1] was officially effected October 5, 1912, by election of the following officers:

Chairman: F. C. Schwedtman, National Association of Manufacturers.
Vice-Chairman: Lew R. Palmer, Association of Iron and Steel Electrical Engineers.
Acting Secretary: Dr. Lucian W. Chaney, U. S. Bureau of Labor.

Company members of the Association of Iron and Steel Electrical Engineers contributed generously in funds necessary to insure free distribution of the Proceedings of the First Coöperative Safety Congress; three hundred and thirty-

[1]For the aims and objects of this new organization as set forth in the Constitution and By-laws see Appendix Q.

six pages, covering five days' sessions; truly, the safety movement owes much to the iron and steel industry; a contribution of which they may well be proud.

Following the Milwaukee Congress, committees were formed; the membership was increased; funds were collected and pledged, and, at its first official meeting at the Fort Pitt Hotel, Pittsburgh, Pennsylvania, January 4, 1913, the Council seemed to be making real headway. Later in the year Mr. Schwedtman resigned owing to the fact that he had assumed new duties, and Mr. Robert W. Campbell, Chief Counsel of the Illinois Steel Company, was persuaded to accept the executive leadership of the organization.

The official emblem was adopted—the White Cross of Prevention on the green background of Safety, with the motto Universal Safety. Messrs. Campbell, Van Schaack, Morey, Avery, and Richards, put the final touches to the eventually adopted Constitution and By-laws.

The following September the second Annual Safety Congress was held at the McAlpin Hotel, New York City. A very comprehensive program was presented, including the first annual reunion—at a joint banquet—with the "proud parent," the Association of Iron and Steel Electrical Engineers. The Honorable John K. Tener, Governor of Pennsylvania, was

toastmaster on this occasion, and, as a coincidence, both Charles P. Neill and Miss Francis Perkins were on the program during the three-day session.

Due largely to the enthusiasm displayed by those attending this second congress, it was decided by the officers and executive committee to authorize the employment of a paid staff, and here is where, as indicated in the first paragraph of this chapter, William H. Cameron steps into the picture. Approximately twenty years of continuous service of this dynamic personality has been of inestimable value to the respective officers and executive committeemen in building the organization from a few scattered committees to an international institution that is now recognized as a real power for the betterment of humanity.

Going over the old records, we find an article by Mr. Cameron published in the *Railroad Record* December, 1913, in which he defined the aims of the council as follows:

> Apart from considerations of public and private safety the Council's chief aim is to reach every employer of labor and make him realize the economic and humanitarian aspects of accident prevention; how, as an economic factor, this means larger earnings and more uniform products; and how, as a humanitarian factor, it leads to diminishing suffering and fewer cripples, widows, and orphans.

One of the first services rendered was the issuing of a weekly bulletin, often illustrated, to show what members were doing in their efforts to reduce accidents. This was a sort of clearing-house service and was probably the forerunner of the poster idea, developed a few years later. Statistical researches were started, and the experiences of certain members in meeting their safety problems were passed on for the benefit of others. Pamphlets on the organization of safety departments followed and a standardization committee worked out simple standards for known types of safety devices.

Realizing early in the game that the field was much broader than industrial safety alone, the name was changed to "The National Safety Council" at the Third Annual Congress in Chicago in 1914. In this same year the first safety poster was issued. The popularity of this poster idea is shown by the fact that during recent years the council has been issuing more than 3,000,000 posters annually, and these find their way to all parts of the country and to many other countries as well. The poster is the picture side of safety—the dramatic appeal. Its effectiveness depends upon two things, as a rule, its brevity and its punch. It talks fast and in a language understood by workers everywhere. It represents a most important factor in safety's progress.

Safe practice pamphlets began to appear a

few years later, recording the tested standards for industrial operations in many lines.

One of the early lessons learned was that to be effective in the war on accidents the safety gun must be double-barreled. In other words, there is safety from within—that is, the mental angle, the educational side. Also there is the external significance, the physical side, as evidenced in the use of guard rails, the wearing of goggles and safety shoes, the use of mechanical safeguards on dangerous machinery, etc. Therefore, the council program was developed to follow what is known as the three E's—Engineering, Education, and Enforcement. Full recognition has been given to these three fundamentals which say in effect: First, mechanical safeguards must be provided; second, man must be taught to do things in the safe way; third, safety rules as laid down by employers or by law must be enforced. When those three elements click we find very few accidents.

Year by year the council sought to increase its efficiency and its service through an ever widening field of activity. The rapidly changing problems of a highly mechanized age had to be met with new safety standards. New fields of industry were enlisted in the warfare on accidents. Climaxing each year's activities, the Annual Safety Congress was held, where members exchanged experiences, profited thereby, and made plans for intensified effort. In 1918

the first issue of *The National Safety News* appeared as the forerunner of many other publications by the council. *Accident Facts,* now accepted as the national statistical authority, made its first appearance in 1921.

In 1923 the Educational Division was established in New York in coöperation with the National Bureau of Casualty & Surety Underwriters, and from here a nation-wide campaign of safety education is carried on in the public schools, and the monthly publication *Safety Education* is issued. Keeping pace with the times, moving pictures were enlisted, and each succeeding year has seen many new channels opened for the dissemination of practical information.[2]

While originally organized to promote industrial safety, the council now functions effectively in widely diversified fields. Its activities broadened as the need for safety became apparent in the home, in the schools, on the highways, and in other places. Today safety work is carried on in industry, on land and sea, in the air, in the mines—in fact, wherever men carry on their activities. There are thirty separate sections in the council directly serving as many fields.

The motor-vehicle accident problem, little dreamed of in the early days of the organiza-

[2]For a complete list of publications issued by the National Safety Council and Bibliography of publications issued in the past, see Appendix R.

tion, began to loom up as a serious menace about 12 years ago as we have seen in preceding chapters. When the council was first organized, no one thought very much about the automobile as a potential killer. With the rapid increase in its use and the consequent increase in motor-vehicle accident frequency and severity, the council met the challenge by organizing a Public Safety Division which today is rendering a highly important service on a country-wide basis. Its efforts are directed toward securing strong drivers' laws for all states; uniform traffic laws; standardization of traffic signs and signals; and strict enforcement and general observance of all traffic laws. It advocates modern highway engineering programs; stronger emphasis on the teaching of safety in the schools and the home; and seeks ways and means of reaching the individual driver and impressing upon him the responsibility for his own acts.

For the home, the council has its Home Safety Division, which also is an answer to the challenge of the times. As we have seen, it is only recently that the seriousness of home accidents, numbering several million a year, has been realized. In its effort to broaden general educational work, this Home Safety Division cooperates closely with the schools, the General Federation of Women's Clubs, the National Congress of Parents and Teachers, the American Legion, and kindred groups.

The three general fields of council activities —the activities of the organized safety movement—are industry, the highways, and the home. Its early years of concentration on industrial accidents have borne fruit. Out of the 89,500 lives lost by accident last year, only 14,500 were occupational deaths, and of this number only about 2,000 actually occurred in manufacturing plants.[3] The big problems today are in the home and on the highways.

In the foreword of this book I said that it would not be a preachment of the doctrine "Safety First," but that it would preach, if it preached at all, the doctrine of "Safety For," and "Safety From." The whole safety philosophy of the council can be summed up in two words which mean much the same thing. They are: "Be careful." The council has spread nation-wide this simple precaution and its staff consisting of scores of industrial safety engineers, traffic engineers, editors, statisticians, librarians, and artists is enthusiastically concerned with keeping it a national slogan and in painting over and over again the picture of the accident situation in the United States in ever changing colors and hung in new frames. The American people forget easily and quickly, and

[3]The balance of the occupational deaths occurred in mines, on railroads, in agricultural work, and similar pursuits other than manufacturing.

one of the big problems is to hold their attention once it is obtained.

One of the most valuable institutions in connection with council activities is its library, which is unique in that it contains practically everything that has been written on safety. Six librarians are kept constantly busy answering the hundreds of inquiries daily. The council engineers alone handle an average of 700 consultation inquiries each month which they could not do without these facilities.

The Annual Safety Congress is the outstanding high spot of the "safety year." Attended by several thousand delegates from all parts of the United States and many foreign countries, it supplies that "fire of inspiration" without which, safety men have long since learned, caution lags and accidents occur. The one word which stands out above all others in the safety dictionary is the word "stimulation." Without it all accident prevention work becomes phlegmatic and this annual congress is the incentive which stimulates the organized safety movement to renewed effort year by year.[4]

The proof of the pudding is in the eating, and

[4]The National Safety Council is responsible for hundreds of smaller gatherings held throughout the year in all parts of the country. They include regional conferences, setional meetings, community gatherings, plant and department meetings. The work of the local safety councils will be discussed in the chapter dealing with Community Organization.

the effectiveness of the council's work—the proof that all of this vast expenditure of time, money, energy, and enthusiasm during the past twenty years has been worth while—is shown by the results. Company members in all parts of the United States have made intelligent use of the information provided and have cut their accident rates to one half or less. Many towns and cities have been able to do practically the same thing in the case of traffic accidents, through the coöperation of the Public Safety Division. Naturally, the work in industry has been more active than elsewhere because the council's support has come largely from that quarter. Accident rates in practically all industries have been consistently forced down for many years. It is significant that among council industrial members, as indicated by reports from approximately 2,400 units, accident frequency rates have dropped 61.5 per cent from 1926 to 1932. Fleet members have made remarkable strides in promoting safe driving, and the council to date has given out more than 2,000 medals for drivers who have gone a year or more without accident.[5]

In the field of public safety, where the greatest number of accidents must be combated, it is encouraging to observe that the efforts of the

[5]For details as to the financing of the council and specific services rendered by it to individuals, industries, organizations, communities, states, and nations, see Appendix S.

council, even with its limited resources for such work, have been showing definite gains in the saving of human life. This is especially true among the children to whom it has been possible to give the most attention.

The National Safety Council has reason to be proud. It is still young as institutions go. A great amount of worth-while work has been crowded into its short life. Digging away at the bedrock of public consciousness, it has made real progress. There were many years when the tide of fatal accidents and injuries was thought to be irresistible, when it crept constantly higher and higher. But it may be said today, after a survey of the entire safety field, that this tide has at least been checked. Much of the credit goes to the National Safety Council as representative of the organized safety movement.

CHAPTER XI

Insurance and the Organized Safety Movement

WHAT *is* insurance?

"Relief from the financial burdens caused by accident, death, illness, property damage or destruction and a variety of other economic losses," says John Citizen. He rarely stops to think of insurance as an institution having very distinct social aspects which set it apart from any other type of business—a business with obligations to society of quite as far-reaching importance as the public utilities, transportation or any of the processes of production and distribution. For as Professor David McCahan of the Wharton School of Finance and Business says:

> By spreading the risk through insurance, staggering losses are averted which might otherwise wreck industries, destroy credit, throw helpless wives and children on public charity, and in other ways disturb the social order. The whole fabric of social and economic life is woven through and through with insurance and its elimination in our present stage of civilization would spell chaos.

It is not difficult to understand why the general public, and even the industry of insurance itself, has always considered the subject of insurance from the standpoint of losses—economic losses—paid. Insurance produces no raw materials, manufactures no goods, and controls no markets; yet, as Henry Swift Ives, Special Counsel of the Association of Casualty & Surety Executives, says:

> Its trade-mark is indelibly impressed upon every manufactured thing. Its sentinels stand guard at every station through which the trade and commerce of the world passes in its long and tortuous journey from producer to consumer. It is only because of the safeguards which insurance offers that civilized man may comb the world for his needs with little fear that he will be deprived of the fruits of his labor by storm, fire, accident, and other uncertainties which constantly beset him.
>
> Should the risk-bearing and risk-eliminating devices provided by insurance suddenly break down and the protection they furnish suddenly be eliminated, our whole well-knit system of production and distribution would collapse like a house of cards, and the modern arts of finance would revert to the pawnshop stage of fiscal history, when credit was extended at usurious rates only upon the pledging of definite property.

In other words, the importance of insurance in our economic system of exchange cannot be

overestimated, and, as Sir Ernest Benn, the great English publisher and economist says, "wealth *is* exchange."

So the individual insurance company, whether it be a life, a fire, or a casualty company, is judged by the public by its *losses* and the manner in which it pays those losses. The quick cash settlement—that is the all-important thing to the policy holder. It matters little whether it is the widow left with a family of small children to support, the home owner whose house has been destroyed by fire, the automobile driver faced with a suit for damages because of an accident, a workman faced with loss of income because of injury or ill health—if the insurance company pays, it is enough, it has performed its function.

Thus we have this great institution known as "insurance," this great social and economic force, looked upon by the American people as some vast reservoir into which policy holders pour billions of dollars and from which millions of people draw money compensation for loss of life, health, or property. The company which pays out the most money is considered the biggest and the best company. In fact, many companies seem to have found it quite worth while to boast, in their advertisements, about the amount of money they have paid to policy holders in the past year, or during the past five years, or past ten years. Insurance agents do the same thing.

Losses, losses, losses, and the payment of money compensation for losses with very little emphasis placed on the simple fact that the more time, and energy, and dollars spent on accident prevention work, on fire prevention work, and on life extension work—the gospel of safety and health education—the fewer the number of dollars to be paid out because of death, disaster, and the destruction of property, and, as a natural corollary, lower premium rates and more insurance protection for the general public.

To understand the great part which insurance can play and is playing in accident and fire prevention, it is necessary to understand the formula by which the business of insurance is conducted. It is a simple one. The gross income of any insurance company—the total premium income plus interest on investments—must at least equal the total amount paid out in losses plus the cost of doing business in which is included overhead, agents' commissions, taxes, etc. If it doesn't, the company soon goes out of business. It is, of course, possible for the losses plus the expenses to exceed the total premium income by a small margin without affecting the financial soundness of the company—if the interest on investments is sufficient to make up the difference. (Premiums are paid in advance, these advance payments are invested and held in reserve for the policy holders' protection, and the company has the interest on these invest-

ments plus the interest on its invested capital.) However, in times of depression this investment income decreases severely. In any event, these two great general items in its balance sheet—losses and expenses—cannot exceed the company's *gross income.*

If the losses—the ratio of loss to premium income—go up, either the premium rate must be increased or expenses reduced. If expenses go up—the ratio of expense to premium income—some way must be found to reduce losses, or the cost of insurance must be increased. These two factors—losses and expense—control the premium rate and the very existence of insurance. What does this mean?

Let us assume that insurance as a whole has a loss ratio of 60 per cent of its premium income and an expense ratio of 40 per cent. In other words, it pays out its total premium income in losses and expenses. This 100 per cent of premium income must not be exceeded. However, if the companies can reduce the loss ratio to, say, 45 per cent of the total premium income by increasing the expense ratio to 55 per cent, the balance is maintained, premium rates are not affected, and the financial condition of insurance remains sound. But—

Such a reduction of the loss ratio may mean that insurance, by the simple device of increasing its expenses, has become an agency for the conservation of lives, health, and property,

which is only a way of saying that money spent in accident- and fire-prevention work reduces the amount of money which must be paid out in losses. Furthermore, if it can reduce the loss ratio to 45 per cent by increasing the expense ratio to only 50 per cent, it can reduce premium rates 5 per cent, and the American people can save *one* twentieth of what they are spending for insurance or buy *one* twentieth more insurance than they are now carrying. The moral to which these facts point is that money spent in safety education, in accident-prevention work, in fire-prevention work and in life-extension work may benefit insurance, the policy-holder, society, and the individual.

A good example of what can be accomplished by approaching the business of insurance from the standpoint of prevention instead of from the standpoint of compensation for losses is to be found in steam-boiler insurance. The companies have considered that their major problem is to prevent the explosion of steam boilers. As a result, the loss ratio for this class of business is *only 15 per cent,* but—the companies writing this class of business spent 60 per cent of their premium income on steam-boiler inspection and preventive work.

This is one class of insurance which seems to have found the complete answer to the question of the obligations of insurance to society other than the one of relieving financial burdens due

to loss of life and property by accident and fire. By spending 60 per cent of the premium income on keeping steam boilers safe, and keeping the balance of the expenses down to 25 per cent, they have only 15 per cent with which to pay losses; but *this is ample.* Many thousands of fatalities due to steam-boiler explosions have thus been avoided.

Another and perhaps even a better example is the situation in elevator insurance. We have seen in a previous chapter that more people travel in elevators each day than are carried by all of our railroads, electric lines, subways, elevateds, airplanes, and baby coaches. It is a highly developed form of mass transportation without which our great metropolitan centers with their office buildings reaching toward the clouds and their many storied hotels and apartment houses would still be in the stage of four- or five-story buildings. There is no form of exposure to hazard due to mechanical contrivances which touches the lives of so many people.

Yet an accident due to the failure of the hoisting cables on a modern elevator is an almost unheard of occurrence. The safeties on modern elevators are of the friction clamp (gradual stop) type that bring the car to a gradual stop should the cables fail.

These elevators move at speeds as high as 1,200 feet a minute, although the passengers are

hardly conscious of ascending or descending. On high-speed elevators the doors are usually automatic. The possibility of an accident occurring on a modern elevator is very small. In fact, the large majority of accidents which have occurred on elevators of all types were due entirely to carelessness.

Again, much of the credit for the total elimination of elevator accidents must go to the insurance companies writing elevator insurance. Elevators are inspected periodically by highly skilled insurance company engineers. The companies spend approximately 76 per cent of the premium income on inspection and other activities for the prevention of elevator accidents and as a result have relatively small or no losses. The premiums on this class of insurance are extraordinarily low.

Reduction of the loss ratio in steam boiler and elevator insurance has been, of course, a comparatively simple matter. Like any other piece of mechanical equipment which is a part of the facilities of business and industry, the steam boiler and the elevator are in a given place, at a given time, and always open to inspection by the representatives of the insurance companies. It is only a matter of efficiency on the part of the inspection department and adequate funds with which to do the work.

The motor vehicle presents quite a different problem. It is here, there, and everywhere—in

the hands of intelligent, unintelligent, and altogether stupid people. It meets up with ever changing conditions—conditions over which insurance has no control. Regardless of its mechanical perfection, it is a potential hazard every minute it is on the open road. Its accident frequency and severity are increasing steadily, and in spite of all they can do, the companies cannot increase the premium rate for automobile insurance with sufficient rapidity to keep the sum of the loss ratio plus the expense ratio within the 100 per cent of the total premium income.

In the year 1930 the National Bureau of Casualty & Surety Underwriters—the organization which makes the premium rates for the casualty companies—fixed the rates for automobile insurance on an expected result that claims paid, commissions, taxes, costs of suits, and all other expenses, would, when added together, amount to 97½ per cent of the total premium income from this class of business. The net result from these rates for that year for all member companies was an underwriting loss of 8.4 per cent. In other words, the loss ratio plus the expense ratio was 105 9/10 per cent of the total premium income. This underwriting loss amounted to $14,000,000, necessitating a marked increase in premium rates for 1932 to avoid any repetition of that loss.

One might go on indefinitely giving examples

drawn from different classes of insurance, all pointing to the importance of the variations in this factor, the loss ratio, to both the manufacturers of insurance and their consumers as well as to the public at large. The outstanding fact is that what is needed is a broader concept of the business of insurance and its obligations to society. It will not suffice to think of it in terms of losses paid—the relief of financial burdens. We—and when I say "we" I mean the insurance companies, the millions of policy holders, and the general public—must think of it in terms of conservation, and "insurance conservation" means the spending of money for the purpose of reducing the loss ratio *faster* than the expense ratio is increased by those same expenditures.

In discussing the new attitude of insurance toward safety accident prevention and a reduction of the loss ratio by spending more money for these purposes, attention should be called to the manner in which insurance executives are supporting safety education as a part of this effort. Through their national organization, the National Bureau of Casualty & Surety Underwriters, the stock casualty companies have been contributing as much as $40,000 a year to the work of the Education Section of the National Safety Council. That this contribution has been quite worth while is evidenced by the fact that this work is, today, saving the lives of no less

than 7,500 school children. One wonders what might happen if a sum of $400,000 could be raised annually for this purpose and how many more lives might be saved. The individual insurance companies, of course, do an enormous amount of work among their policy holders in addition to activities conducted through the bureau.

In order to understand the relation between workmen's compensation insurance and accident prevention work done in industrial plants by the compensation insurance carriers it is necessary to know something about the procedure followed by the underwriters when taking on a risk. First of all, the employer is given what is called a schedule or base premium rate. This is a rate which experience has taught the insurance companies is adequate for the particular type of industry under normal conditions.

Just as soon as the company is "on the risk," the engineering and inspection department begins to receive regular reports. If, after a given length of time, the accident experience is shown to be unusually good—that is, better than the normal—the employer begins to receive credits on his premiums. If, however, the accident experience is bad—that is, if the cost of accidents is greater, there are more accidents than experience has taught the companies to expect—he begins to receive debits. In other words the company's experience with the risk definitely

affects the cost of the compensation insurance to the employer. In addition to any humanitarian impulses he may have, it is directly to his benefit to coöperate with the insurance engineers in making his plant as safe as possible.

A concrete example will show, perhaps, just how this works out in the interests of the employer, the employee, and the insurance company. A certain large company insured an industrial plant. Everything went along satisfactorily until suddenly the engineering department of the insurance company received reports of some fifty minor eye accidents in one month. Something must be radically wrong, and inspectors were immediately put on the job. It was discovered that all of these accidents had happened in one department, and that only some four or five employees were involved. Then it was discovered that these employees had removed the glass screens installed to protect their eyes because they had become badly scarred, and they were either too lazy or too indifferent to report them and get new ones. This pinned the responsibility directly on the foreman. He was called up on the carpet and given a brief time within which to clean the situation up or look for another job. There was no further trouble in that plant due to an unusual number of minor eye injuries.

Another interesting example of what can be accomplished by coöperation between the em-

ployer and the insurance company is provided by the case of a large bus transportation company insured for workmen's compensation, public liability, and property damage by the same company as the one involved in the eye injury experience. In this case the management has notified all bus drivers that when the insurance company inspectors are riding the buses they are to be considered as part of the management. When one of these inspectors discovers a driver who is "heavy footed," or indulging in "cowboy driving," or "jumping the lights," he talks to him before reporting his observations. If the driver mends his ways—and he almost invariably does—nothing more is heard about it. He is always given a chance by the insurance company, however, before he is "turned in" to his employer.

An interesting situation developed in this particular case—one filled with potential danger for both drivers and passengers. It seems that the drivers and the maintenance men were always at loggerheads. The drivers said that the maintenance men were nothing but a lot of grease monkeys, sending them out time and time again with brakes not properly adjusted, while the maintenance men claimed the drivers were just a lot of roughnecks intent on shaking the equipment to pieces as rapidly as possible. After a great deal of careful and diplomatic work the engineer inspectors of the insurance company

were able to get these two warring factions together and bring about 100 per cent coöperation between them in the interests of the public, the bus company, and themselves. Today they are working in absolute harmony.

As in the case of elevator and steam-boiler insurance, the underwriters of workmen's compensation insurance have quite a different problem from those involved in automobile insurance. In compensation insurance the insurance company deals with a common group which is under supervision. As stated in a previous chapter, the management of an industrial plant selects the employees, trains them, assigns them to their work, and is in a position to exercise the strictest supervision over the manner in which that work is performed. By whole-hearted coöperation with the insurance company engineers, management can make its plant safe and—to repeat for the sake of emphasis—"eliminate lost-time accidents almost entirely."

Plans which will prevent accidents on the streets and highways, in the homes and in industry; plans which will prevent fires; plans which will reduce illness due to occupational diseases which not only mean economic loss of themselves but which are prolific causes of accidents; plans which will prolong the ordinary span of life; plans which will educate this great and careless public of ours to an appreciation

of the fact that accidents *can* be avoided; human conservation on a grand scale—this is the only way the loss ratio can be reduced, premiums kept within the capacity of the pocketbooks of everyone, and the obligations of a great institution dealing with human life, health, and happiness discharged.

Which is better? To spend 60 per cent of the premium income in the payment of losses and only 15 per cent in safety and prevention work, or, as the steam-boiler insurance people do, to spend 60 per cent on prevention and inspection with the result that they have only to spend fifteen per cent in the payment of losses? Furthermore, it must not be forgotten that in the payment of losses insurance pays only the tangible losses—it cannot pay the intangible losses to society due to loss of life and property by accident. If results of this kind can be accomplished with the steam boiler, surely similar results can be accomplished with other kinds of mechanical equipment whether in the factory, in the home, or on the streets and highways.

These facts present nothing new to the progressive insurance company executive and engineer. He has been thinking about them for years, and because he has been thinking about them the expenditures of the big companies for safety and prevention work have been increasing by leaps and bounds as our daily lives have become more and more complicated. If they

hadn't been thinking about these things, and if they hadn't been making these expenditures, our annual accident and fire rate would make our experience in the World War look like a Sunday-school picnic marred only by the few minor casualties which usually accompany such affairs.

When compulsory workmen's compensation insurance was first proposed there was some doubt in the minds of insurance executives as to the practicability of laws requiring the payment of specific sums to industrial workers as compensation for specific types of accidents. They approached the underwriting of the accident risk in large manufacturing establishments under workmen's compensation laws with some hesitancy. Today the insurance companies are to be found among the most enthusiastic supporters of this plan of defining the insurance risk and 44 of the 48 states have legislation of this kind on the statute books. According to Mr. Whitney of the National Bureau of Casualty & Surety Underwriters, the effect of these laws plus the progress of the organized safety movement on the accident situation has been significant. In many industrial establishments accidents have been cut a half, or three quarters, or even more. Much of the credit of this reduction goes properly to the institution of insurance not only for its support of the safety movement, but for the work done by the individual companies.

Back of the organized safety movement; back

of workmen's compensation laws; back of those two great conservation movements, accident prevention and fire prevention, will be found the insurance engineering executive whose youthful department has now become one of the most important factors in the conduct of the whole business of insurance. He is the meddler Mr. Harry Chase Brearley tells us about when he says, "Man was not man until he began to meddle." It is the safety engineer who said, "We must change conditions," and then set about the finding of ways and means to reduce or eliminate hazards responsible for accidents or fires. The Great General Staff in the human warfare against hazard is made up of these men.

The opening battle in the war against accidental loss of life and property was the great campaign of fire prevention, yet fire prevention, on any important scale, is scarcely more than thirty-five years old. Originally promoted by the fire insurance interests, it soon grew into a nation-wide coöperation of individuals and organizations working by many methods, but to a common end.[4]

Today public schools (in some states) are required by law to teach the rudiments of fire prevention and have periodical fire drills; we have fire prevention days proclaimed by the President of the United States and the governors of the various states; we have fire prevention

[4] *A Symbol of Safety,* by Harry Chase Brearley.

weeks; building codes are being made increasingly rigorous; standards for electrical and other forms of installation have been worked out in great detail and not only promulgated but frequently made the subject of legislation; there is a growing market for fire prevention appliances, and the popular mind becomes more and more responsive to the idea of protection from the fire hazard. But, best of all, the subject has become "news," and our newspapers and magazines are devoting much space to it. Fire prevention was even officially enlisted during the war, and fire prevention engineers played an important part in safeguarding government property and in inspecting materials and supplies. For this public acceptance of the importance of fire prevention, as well as for modern methods of preventing fires, we have to thank insurance and particularly the National Board of Fire Underwriters, National Fire Protection Association, and the Underwriters' Laboratories.

The next field of human conservation to claim the attention of the insurance interests was the industrial field—the safeguarding of working machines such as appliances in machine shops, metal-working shops, and foundries. It is due very largely to the pioneer work of the casualty companies that American industry can come forward with a record of only approximately one half the number of fatalities caused by the auto-

mobile and a trifle more than one half the number caused by accidents in the home. It is the money spent on research work by these companies which has produced the modern safety standards for the construction of factory buildings and for the protection of workmen from moving machinery.

Go into the laboratories of the engineering department of any great casualty company. Mr. John Citizen will be not only surprised but intensely interested. Over on one side he will find a complete factory in miniature, from power house to machines for individual work, with transmission machinery showing various types of guards; elevator shafts and elevators moving up and down; stairways with proper guards; and everything else to demonstrate how accidents might happen and how they may be avoided. Over on another corner will be found a model for demonstrating the correct installation of electric wiring. In another will be found elevator shafts and devices for keeping the unwary from falling into them and breaking their necks.

On a table opposite the model of the factory one sees what looks like an elaborate model of a children's slide for the back yard. Inquiry develops the fact that this is where the "slipperyness" of floors and floor coverings is investigated. Various kinds of surfaces are placed on the slide and the ease with which a

weight will slide down them recorded. On another table are several pairs of shoes. These are being used in a series of experiments for discovering how best a shoe can be constructed so that if a workman drops a heavy casting on his foot it will not be crushed.

Stepping down the hall one passes through another door and into what might very well be the chemical laboratory of some research foundation. Occupational diseases are both the vocation and advocation of the engineers in this department. Long ago it was recognized that health is closely allied with "proneness" to accident on the part of the employee and that health conservation goes hand in hand with accident prevention. Certain processes in manufacturing are often accompanied with certain types of disease, and it is the elimination of the cause of these "occupational diseases" that has become a very real problem with insurance companies —as we have seen in a previous chapter.

With the coming of the automobile there came all sorts of automobile insurance—insurance against fire, theft, public liability, collision, property damage, etc.—and immediately a new series of problems was created for the fire and casualty insurance companies. These problems included not only the drivers of cars involved in accidents who might be policy holders, but accidents to pedestrians who might carry accident insurance, accidents to passengers in auto-

mobiles, and, in fact, almost every kind of hazard with which insurance is concerned. The insurance engineer quickly found himself involved in all sorts of new problems from the design and construction of the automobile itself to the design and construction of highways, automatic traffic-control devices, motor-vehicle legislation for the control of the use of the highways, and a score of other things, ranging from such items as the weight and size of buses and trucks to the visibility at highway intersections and from the maximum efficiency of headlights to outdoor advertising (billboards) and the height of hedges.

Insurance has made many invaluable contributions to the efforts to solve the accident problems created by the automobile. It is spending millions of dollars every year, and the time of thousands of technicians, engineers, and students of traffic conditions. Yet in spite of all it has done and is doing, both directly and through innumerable agencies, the loss ratio for this class of business steadily rises. Already it has become a serious question as to whether a premium rate can be maintained which will keep automobile insurance within the reach of the average man, even though he have a comfortable income.

It is in the field of education—education of the general public and education of coming generations through its support of safety education in the public schools—that insurance has had

its greatest opportunity and has been quick to seize it. It is, in fact, in this field where it can make its greatest contributions in the future, and it will have to do so if it is to maintain its leadership of the organized safety movement and discharge its obligations which, as this chapter is attempting to point out, have become preventive rather than compensatory.

In one way or another insurance is in touch with almost every man, woman, and child in the country. It goes, through the door of life, health, accident, and fire insurance, into a majority of the homes of the United States. Because of workmen's compensation and employers' liability insurance it reaches into every place of business where men are paid salaries or wages. It rides on almost every automobile. Its great army of employees—agents, solicitors, inspectors, engineers, medical corps, underwriters—is represented in every hamlet, village, town, and city. Its influence is without limit, and its cooperation with any safety program or campaign cannot help but accomplish almost any desired result.

Laying aside for the moment the humanitarian phases of the relation of insurance to safety work, let us destroy, once and for all, an extraordinary fallacy in the attitude of many people toward insurance. This is the feeling that it actually makes a profit out of misfortune—pays dividends on accidents. Nothing could be

further from the truth. On the contrary, an insurance company can make money only by preventing accidents, and by curative medical and surgical treatment when accidents occur. This is a part of the service given by insurance companies—it is a part of their expense of doing business and, to return once more to our steam-boiler example, it is the way in which they keep down the loss ratio.

Insurance has given whole-hearted support to the organized safety movement—financial support, moral support, and that kind of support which goes with the recognition both of social obligations and of the requirements of good business economics. What can insurance do in addition to what it is already doing to reduce the accident frequency and severity? Cut down the loss ratio by increasing the expense ratio—spend money and more money in this great work and reverse the two items in its balance sheet, loss and expense. That there is a great movement in this direction is more than evident. That it will do more to accomplish the desired result than almost any other movement is also evident.

CHAPTER XII

Accidents, Safety, and the Public Schools

FANCIES, fads, and frills!

It seems strange that scarcely more than twenty years ago this phrase was constantly on the lips of members of boards of education and local councils whenever the question of expenditures for the public schools was up for discussion. "We must keep down the cost of our public schools; it is getting away from us"—"Too many frills"—"Let's get a dollar's worth of good old-fashioned education for every dollar we spend"—"Why all these extras, anyhow?"—and so, in innumerable communities, the development of courses of instruction in art, music, domestic science, vocational training, and many other so-called "extra-curriculum" subjects, now considered as essentials in any well organized system, was hampered and delayed. Plenty of money for ornate and oversized school buildings to which the City Fathers might "point with pride," but very little money for the teaching of anything but "readin', 'ritin' and 'rithmetic," which was considered a suffi-

cient preparation for the "average" child with which to meet the many problems of life.

Fancies, fads, and frills! Into this category went everything not thoroughly understood by the village trustee, the town councilman, the city alderman, the state legislator, and even the member of Congress. "Domestic science? Well, in my day girls were taught by their mothers to cook and sew.[1] Art? Fol-de-rol. Better be learning the multiplication table than how to draw pictures. Physical training? I got mine on the wood pile. Music? Shucks. Vocational education? No boy that is worth his salt has to go to school to learn how to drive a nail or saw a board."

And into this category went, when it was first suggested, any proposal for the teaching of safety and accident and fire prevention in the public schools. It was just another fad, another frill which would cost time and money and which had "no real place in public school education." To the less progressive boards of education it had little or nothing to do with mathematics, geography, grammar, history, and all the other subjects which have made up the

[1]In January of this year a prominent Supreme Court Justice of New York urged the discontinuance of what he called "some of the bunk" in the city school system. In connection with this "bunk" which he asserted existed in the school system, he cited a school kitchen in the Bronx which he said cost the city a needless expense. "We don't need that kitchen," he claimed. "The girls can learn to cook in their mothers' kitchens as they did in the old days."

curriculum of the average public school since the day when Thomas Jefferson first called for an adequate national system of public schools, and therefore it had no part of the public school's responsibility to the coming generation. Leaders of the organized safety movement not only had a difficult time (they still do in some areas) with boards of education, but also with teachers, principals, and even superintendents, who are supposed to have a broader conception of the real meaning of education.

Yet of all the means at hand for a reduction of the tremendous loss of life and property each year by accident and fire, there is no single agency of greater value than this very public school system of the United States. Its value lies not only in the fact that safety education in the schools saves the lives of children, but also in the fact that accident and fire prevention taught the children in the classroom actually reaches into the home and can be made a great factor in "getting across" to the parents the fundamentals of life and property conservation.

To understand just what the public school system can contribute to the organized safety movement, it is necessary to have some understanding of the magnitude of that system. Few people appreciate the tremendous size of our public school plant—that is, the elementary and secondary public schools, exclusive of normal schools, colleges, and universities. It is com-

posed of nearly 250,000 school buildings having a total value, in 1930, of approximately $6,000,000,000. These buildings house more than 25,000,000 children, which is 81 per cent of all persons between the ages of 5 and 17 years in the United States. It employs nearly a million teachers, principals, supervisors, superintendents, administrative officers and their assistants, janitors, drivers, messengers, attendance officers, etc., and has an annual payroll of $1,250,000,000. Other expenditures amount to $1,000,000,000, making a total annual expenditure for public school education of $2,250,000,000—more than 4 times as much as it was in 1914, just 20 years ago.

What should the people of the United States expect for this vast expenditure of money and for the employment of this great army of people who make up the faculties and other personnel? What are the responsibilities of the boards of education, the teachers, and their administrative officers, who have assumed charge of the mental development of 25,000,000 children, year in and year out, coming and going? Are they only required to make them literate, or should they make every effort really to prepare them for life and its many hazards—physical, mental, and moral? And if the latter, what subject, in view of the situation as we have seen it in preceding chapters, has a better right to an important place in the curriculum than safety

education—instruction in how to avoid or prevent accidents and fires?

It is generally accepted by educators that the schools should educate the child for "life." In fact, it is often stated that the function of secondary education, its first objective, is to teach the students "to do better those things they are sure to have to do in life." If this is true, it means that the public school, if it is to discharge *all* of its responsibilities, must concern itself not only with the three R's, but with character building, with health and with accident prevention, as well as with many other things. The child begins to meet the problems of life when he starts to school unaccompanied by an adult—he or she is then facing the many hazards of the streets and highways. Safety education properly begins, therefore, in the kindergarten and should continue on until graduation from high school.

An interesting phase of this whole question is the fact that instruction in safety and accident and fire prevention can be introduced into the curriculum of the public school with little or no expense and takes away very little time from routine studies. It can be made *a part of the routine studies,* giving them an added interest, a zest, a sparkle, for it presents the lessons in terms which represent, to the child, the situations which he or she is meeting every day in the home, on the street, and in the school.

There is no reason, for example, why arithmetic should be taught in terms of yards of cloth, bushels, feet of lumber, or distances. Much of it can be taught in terms of safety education. The same thing is true of history or geography. Modern history today is no longer the story of military accomplishments. It is the history of the development of the nation, and it is a comparatively simple matter to bring in the story of the accident rate and the development of safety practices in our major industries, on the railroads, in the home, and in scores of other ways having to do with the conservation of life and health.

Assuming, for the sake of argument, that school officials from the janitor or custodian to the superintendent and board of education have some measure of responsibility for the safety of children in their care, as well as their instruction in the best methods to avoid accident, what is the first item to be considered? It seems to me to be the school itself. Are the 250,000 buildings housing 25,000,000 children safe, or are a certain percentage of them traps which may at any moment provide us with the news of some great catastrophe?

We are told that there are five school fires every day. True, the majority of these fires are very minor affairs, resulting in little more than some slight damage, such as a bit of scorched

paint or the burning of a few papers. But any one of them presents the possibilities of a holocaust, and some of them have resulted in a heartbreaking loss of child and adult life. One hundred and seventy-six children and teachers met death when the three-story Collingswood school burned. Thirty-six died when the one-room rural school at Babb's Switch was destroyed by a fire that broke out during a Christmas party. Boards of education and their chief administrative officers, the superintendents of schools, are responsible for the prevention of these fires which in 1932 caused in addition to the deaths and personal injuries the destruction of property valued at $6,941,400.

"Is your school a fire trap?" asks Mr. T. Alfred Fleming, and answers: "We still send millions of our children to institutions that are worse than that little grammar school in Ohio [Collinwood], where one hundred and seventy-six lives were snuffed out."[2] A survey of several thousand schools in different parts of the country a few years ago condemned 37 per cent of the buildings studied as rank fire traps. At that time the National Fire Protection Association asserted that 90 per cent of our schools belong in that dreaded classification. Average these two

[2]"Is Your School a Fire Trap?" by T. Alfred Fleming, as told to Paul W. Kearney; *Ladies' Home Journal,* 1932, and reprinted by the National Board of Fire Underwriters, 85 John Street, New York City.

figures, and the reader will find that more than half of our schools ought to be torn down.

How can a school official be so blind that he or she is willing to "take a chance" on the horror of some great school fire. A state superintendent of education tells Mr. Fleming, when he urges the need for fire prevention education in the schools: "Our people don't need it." Four months later a fire destroys one of his two-story schools in twenty minutes—and "put seventy-seven roasted victims in a common grave."[3]

The next item for consideration in connection with the safety of the school itself is the opportunities it presents for accidents—broken arms and legs and even necks. This involves such questions as architectural layout, equipment, and supervision. One third of the accidents occurring to pupils in school buildings occur in gymnasiums, largely in the grades above the fifth, while a very considerable portion of upper-grade accidents happen in vocational education shops. Surprising as it may seem, the youngest children are by no means most frequently hurt at school.[4] Among a thousand accidents which occurred on school grounds, the

[3]For a complete program in fire prevention education and discussions of architecture, construction, equipment and the conduct of fire drills address the National Board of Fire Underwriters, New York City.

[4]See "The Safe School," by Kate Kelly and Marion Telford, published in *The Child Welfare Magazine,* National Congress of Parents and Teachers, Washington, D. C.

largest number happened to sixth-grade children. Among a similar number which occurred in school buildings, the majority were to seventh- and eighth-grade children.

In 1931–1932, out of a group of nearly half a million school children approximately 7,000 suffered injuries sufficiently serious to keep them out of school. Some of these absences were for a day, some for a few weeks, and some lasted months. About one third of the total occurred while the children were on school property—1,409 on playgrounds and 1,040 within the school buildings. Most of the accidents occurring on playgrounds are due to faulty equipment, improper use of good equipment, wrong grouping of pupils for use of apparatus and inadequate social education.

These are only a few items picked out of the vast amount of available information showing the need for safety education and accident prevention in so far as the school and school grounds are concerned.[5] Instruction in how to avoid these types of accidents should by no means be confined to the pupils themselves—the first job of the organized safety movement, the parent-teachers' organizations, and parents is to see that the teachers themselves understand the fundamental principles of accident prevention, know how to pass their knowledge on to the

[5]For detailed discussion of the essentials for safety in and around the school and Bibliography, see Appendix T.

children and how to supervise their school activities in such a way that real prevention will be accomplished.

That the teachers themselves are often quite as badly in need of instruction as the children is illustrated by a story told by an executive of the Education Section of the National Safety Council. She had been addressing a group of public school principals, and during the course of her remarks said she had been told by the superintendent that he held the principals responsible for the safety programs within their respective schools.

"That means," she continued, "that all of you must know the common causes of accidents and how to avoid them. I wonder if all of you know how and where to cross a street."

This was greeted with much laughter. Of course, any intelligent grown person knew how and where to cross a street! "Really, the speaker was good but this was laying it on a bit thick."

That afternoon one of these principals was killed on her way home by a motor vehicle. She stepped out from between two parked cars directly in front of it. She was one who had laughed heartily.

Leaving the school property, we are immediately faced with the problem of getting the children to and from schools safely. It is at this point that we meet with the first determined resistance on the part of a certain type of school

authority when the effort is made to introduce instruction in safety into the curriculum. It is frequently claimed that except in those cases where the authorities provide transportation, such as for children beyond the limits of the school, authorities have no responsibilities for the safety of children beyond the limits of the school property, and that it is solely the duty of parents to see that they use the streets and highways properly.

This would be all very well if all parents could be depended upon to assume this responsibility and to be intelligent enough to discharge it. But they can't, and 5,030 children under 15 years of age were killed by motor vehicles in 1931, while scores of thousands were more or less seriously injured. Furthermore, it has been definitely proven that in those communities where an adequate program of instruction in street and highway safety has been incorporated in the regular school program there has been an immediate reduction in this class of accidents not only to children of school age but *to adults as well.*

This latter fact is interesting. Why should instruction in street and highway accident prevention in the public schools result in a reduction of those accidents in *all* age groups? For the very simple reason that what interests the child interests the intelligent parent; and safety education can be made interesting—sufficiently

interesting to cause the child to carry what he or she has learned into the home. A very simple example of this will be found in the highway safety tests prepared by Dr. Herbert J. Stack of Columbia and Rutgers universities and the National Bureau of Casualty & Surety Underwriters. I will defy any driver of a motor vehicle to look at these tests, which are in three sections and include fifty questions, and resist the temptation to see what he can score. Once he has made this effort he has immediately received a liberal and intensive education in safe driving.[6]

The question of transporting children to and from school by means of school buses is a serious one. More than 2,000,000 school children use these buses every day and there can be no question of the responsibility of school authorities for the efficiency of both the bus drivers and the buses—for the safety of the children themselves. Once these children have climbed aboard one of these buses, they are on school property and any negligence on the part of the school authorities or their employees places the responsibility for an accident squarely upon them—they cannot "pass the buck" to the parents or to the children.

Unsafe and overcrowded school buses are a menace, and the sooner parents and teachers

[6]For a complete description of these and similar tests, as well as a detailed program for the teaching of street and highway safety in the public schools, see Appendix F.

make up their minds to it, the quicker will accounts of school bus accidents be eliminated from the news columns of our daily newspapers. The trouble is that so many school authorities have been judging this form of school transportation by the cost per pupil per mile. Just as the great god Economy will cause some officials to snap their fingers at fate and leave wooden stairs for children to use in escaping from a burning school building, or some other fire hazard, so does he cause them to snap their fingers at fate by overcrowding buses, disregarding not only the increase in accident possibilities, but the health and moral problems which are involved in this overcrowding. The same "penny-wise" policy keeps in service types of buses that should have been relegated to the junk heap long ago, fails to have both buses and their equipment properly inspected at regular intervals, and employs drivers whose contact with any kind of machinery should be limited to pushing a wheelbarrow.

It also frequently happens that, in order to save money, a high-school student is employed as the driver of a school bus instead of an experienced adult driver. This is a very serious matter and may be a highly dangerous procedure. If it is the duty of the school authorities to make bus transportation as safe as it is humanly possible to make it, they are not discharging that duty when they employ a student

driver who cannot be expected to have had the experience nor to have the judgment in an emergency of the professional bus driver. Furthermore, he is known to the pupils he is carrying, is "one of the gang," so to speak, which does not make for the strict discipline which should be maintained while these buses are in transit loaded with school children.

Somebody should have absolute and unquestioned authority over all drivers of school buses, types of buses, the method of their operation, and everything else connected with this highly specialized form of transportation. It might be the local superintendent of schools, the state superintendent, the local police or the state motor-vehicle department. Whoever it is, he should make rules for the employment of drivers, adopt the necessary form of mandatory examination of them, investigate the habits of applicants for jobs as bus drivers, and fix instant discharge for the slightest infraction of any of his rules and regulations. He should be authorized by law to order any school district to abandon the use of any bus which in the opinion of his inspectors is unsafe.[7] Heavy penalties should be established for overcrowding. Rules and regulations should be adopted for loading and unloading. And last, but by no means least

[7]The inspection of buses and equipment and the examination of drivers can be delegated to the motor-vehicle authorities, if desired.

important, children should be taught "bus manners"—a course in conduct which will add to the safety of bus transportation. Assuming that the state superintendent of education, having received such wide authority, discharges his responsibilities, parents can then feel reasonably safe in entrusting their children to the school bus.

Having provided—in so far as it is humanly possible to so provide—for the safety of schoolchildren in the school, on the playground, and on the way to and from school, there comes the question of safety and accident prevention in the home. We have seen in previous chapters that the home is as prolific a producer of fatal and personal-injury accidents as the motor vehicle. Of the 29,500 fatal accidents occurring in the home in 1933, no less than 5,030 happened to children under 15 years of age. Why should not these children be taught methods of avoiding or preventing accidents in the home? This question becomes particularly pertinent when we appreciate, once more, that the easiest way to reach parents is via their children, and if this subject can be made sufficiently interesting in the classroom, we have the organized safety movement reaching into the home with both fire and accident prevention.[8]

If we conclude that safety education has an

[8]For a program for teaching accident prevention in the home, see Appendix T.

important place in the public school curriculum —both primary and secondary schools—and that by following a coördinated program for teaching it, what is the quickest way of forcing its acceptance as a part of our national education system?

Whenever any organization, whether it be business, social, or economic, desires to accomplish something and that something quickly, it turns its eyes longingly toward the state capital or Washington and appoints a committee on legislation. In due course of time this committee descends on the Legislature, demands a law commanding this or prohibiting that, and, if the legislators do not know very much about it, or if there is no great objection on the part of a considerable number of voters, a law is passed. One of the results of this procedure is that our legislative factories turn out thousands of new laws each year which, together with amendments to old laws, have placed on our statute books commandments governing every conceivable mental, physical, and moral process known to the mind of man.

Legislation directed toward the curriculum and methods of teaching in our public schools is always dangerous. It is a grave question as to whether instruction in safety and accident prevention should be forced into the schools by legislative fiat, no matter how desirable it may be, or whether it should be brought about by

educating boards of education, school superintendents, and the teachers themselves. The supporters of legislation on safety education in the schools maintain that such legislation dignifies the subject by giving it official recognition and a position comparable to the old line subjects—announces, in effect, that it is not a fad and is here to stay. Furthermore, they claim that by "legalizing it, the individual teacher and school administrator can justify the expenditure of school time and money on it."

On the other hand, opponents of any form of legislation claim that legislators are not capable of wise judgment in such matters as school curriculum or school procedure. They set forth that there is grave danger in any legislative action which results in "artificial" programs and claim that there is weakness in any law which carries no penalty for failure to observe it. No state law requiring safety education or education in the prevention of accidents provides that the school official who fails to observe it shall pay a fine, or go to jail, or even be brought up on charges of neglect of duty.

If we abandon the idea of legislating safety education into the schools we must depend entirely on the organized safety movement to accomplish its inclusion in the curriculum. In accomplishing this purpose one of the most important organizations in the United States is the National Congress of Parents and Teachers with

its million and a half members, 20,000 local units in 47 states, Hawaii, and the District of Columbia.[9] They are "the parents and teachers of the white and yellow and black children who are the pupils of our democratic public schools; the parents and teachers of Yankees, Indians, Japanese, Germans, Poles, Jews, Italians, Spaniards and others, who are desirous of working together solely that the lives of children may be made happier wherever they may live, regardless of race or color."

Anyone who has served on a board of education or as an official of a public school system is quite aware of what a well organized, well officered, intelligently conducted Parent-Teachers Association can do once it swings into action. It is the organized teachers and parents of the children taught by these teachers and represents a force in the community which is almost irresistible once it gets behind a well thought out and practical program. It can eliminate fire hazards and even force the closing of school buildings where the fire and accident hazard is too great to be met by any reconstruction. It can remove careless custodians and reckless drivers of school buses. It can demand and obtain traffic officers to guard dangerous street crossings during the hours when children are going to and returning home from school. It can eliminate in-

[9]For the safety program of the National Congress of Parents and Teachers see Appendix U.

efficiency and provide nourishing food and pure milk for poor children. It can bring about a program of safety education in the public schools. There is very little it cannot accomplish if it is well organized and has an enthusiastic membership.

The National Congress of Parents and Teachers through its National Committee on Safety and its 20,000 local units has a well-developed safety program or plan which has the following objectives. These are:

(1) To teach parents how to avoid accidents; (2) To aid parents in giving the maximum protection to children at home and on the streets; (3) To aid teachers in giving children the maximum protection while on school property; (4) To aid both parents and teachers in the development of safety skills and attitudes among children that will make possible active and adventuresome lives; (5) To develop in the community a sense of responsibility for child and adult safety.

This is an ambitious program. The activities and projects proposed by the plan include a study of home hazards through home inspection; securing home first-aid kits; sponsoring standard schoolboy patrols; sponsoring high-school motor-traffic clubs; working for state legislation regulating school buses; prohibiting the indiscriminate use of fireworks and firearms, the drivers' license law, encouraging first

aid and swimming classes; and coöperation with community organizations actively engaged in sponsoring safety programs.

To show what can be accomplished, the Division of Research and Information reports over 1,000 specific safety projects during the year ending June, 1933. These included providing supervision for ice skating rinks, arranging for clear streets for coasting, securing no-parking signs for the front of school property, supplying first aid equipment, surveying home hazards and countless other projects.

Whether safety education is to be forced into the public schools by law, or whether it is better to leave its inclusion to the community, the organized safety movement, and the Parent-Teachers Association, there is little doubt but that the fundamental approach to a solution of our national accident problem lies in the education and training of children, and the records show this to be true. Since 1922 adult fatalities have increased 38 per cent while child accidents have decreased 2.3 per cent—*safety education in the schools is now credited with saving over 7,500 children each year.*

Can there be the slightest question or discussion over its inclusion in our educational system?

CHAPTER XIII

What the Police and Courts Can and Would Like to Do

IN ONE of his delightful stories, which appear in the *Saturday Evening Post* from time to time, Mr. Frederick Hazlett Brennan records a bit of philosophy addressed by a captain of detectives to a sergeant who is thinking of getting out of the department. The captain says:

The girl and the newspapers together, isn't it? . . . Yes, I know. We've all been catching hell. A couple of tough babies over at the Ninth beat up a hop-head and the town rises in its righteous wrath. We're all thugs. A precinct copper gets caught protecting a speak-easy and we're all crooked. A traffic cop bawls out a speeder and we're all dirty-mouthed loafers who ought to be out catching real criminals instead of picking on respectable citizens. That's the trouble, isn't it, Jim? . . .

Public support! You want it, I want it, we all want it. We can't enforce the law without it. But what does the public do? It turns the police power —the most important power in government—over to a gang of third-rate hams. . . . It wants honesty

and diplomacy and sound character and intelligence for two hundred dollars a month.

"The most important power of government" —the police power. Mr. Brennan has written into a fiction story one of the fundamental principles of government. To it he might well add that the two most important functions of the police are *safety and convenience.* Police departments are being called upon constantly to suppress some new threat to the safety and convenience of the public and in almost every instance they are successful but they do not always receive the credit they deserve. The city traffic police and the state highway patrols are supposed to control conditions so that streets and highways are "safe and convenient" and accidents reduced to a minimum, but if a cop "bawls out" a speeder, a careless driver for passing a red light or for making a left-hand turn around a sign which expressly forbids a left-hand turn, or some sweet young thing for leaning her sports roadster up against a fire plug or a "no-parking" sign, he is a "dirty-mouthed loafer who ought to be out catching real criminals instead of picking on respectable citizens."

We read in a metropolitan newspaper in October, 1933, that "Robert Kohler, who ended a year's term in prison only recently as a result of an automobile crash in which two Nassau County policemen were killed, was in jail again

today, charged with driving while intoxicated. The arrest of Kohler, 31, came after he had driven his car up on the sidewalk in South Franklin Street, Hempstead. Dr. Theron Kilmer, who examined him at the Hempstead police headquarters, said he was intoxicated."

This brief account of an incident of so little importance that it was found in a corner of page 9 raises one or two interesting questions. Kohler was responsible for the death of two policemen, but the judge gave him only a year *in jail.* He must have been responsible or he wouldn't have received a jail sentence. The only answer to the briefness of his stay in jail is that he killed a "couple of cops" instead of a couple of "respectable" citizens. He gets out of jail and is once more permitted to drive an automobile on the streets and highways. Again he is arrested—this time for driving on the sidewalk while drunk. It must be discouraging to the police of Nassau County.

With the coming of 26,000,000 automobiles in the United States (which means that almost everybody rides in some kind of a motor vehicle) a new problem has been created for the police—a problem of public relations. What the police of this country need—whether it be a metropolitan police force, a state highway patrol, or a town constable—is a public relations department. Before the police can even approach the problem of traffic control and

regulation, the public must be made to understand just what the traffic officer means to its "safety and convenience." Until that is accomplished, until men and women acquire the habit of thinking of him as a symbol of a law with which they have no quarrel, and the motoring public places itself squarely behind him as the last word in authority over the streets and highways, he will continue to be faced with almost insuperable difficulties in any effort he may make toward reduction of the motor-vehicle accident rate.

After all, why not? Corporations and all sorts of great business enterprises, national trade organizations and chambers of commerce, executive departments of government, and movements of every conceivable kind, all have their public relations or publicity departments under one name or another, organized for the purpose of selling goods, ideas, philosophies, proposed legislation, and even individuals to the public at large. General Johnson maintains an enormous publicity organization for the purpose of selling the N. R. A. to the American people. If the police, in dealing with this intangible and far-reaching problem—traffic accidents—have failed to secure the support of the public in their strenuous efforts to control the traffic situation, then it is up to the taxpayers to provide them with a selling organization, a public relations department.

There is no more reason why a policeman should not sell his stuff by means of newspaper publicity, paid advertising, the radio, or in any other way than that a candidate for President or a manufacturer of household gadgets should not sell his stuff by making use of the same facilities. This is particularly true when one realizes that all the policeman is pleading for is support in doing his duty and that, after all, he is only enforcing laws designed to secure that very "safety and convenience" for which police departments exist.

Law observance and law enforcement are of primary importance in solving the traffic problem. Enforcement brings results, as has been definitely proven in many communities, but only in those communities where the citizens have been 100 per cent behind the police in their efforts. Under the direction of Mr. Franklin M. Kreml, chairman of the Committee on Law Enforcement of the National Safety Council, a "Traffic Law Enforcement Demonstration" was carried on in 22 cities. Only 4 of them failed to produce a reduction of 15 per cent or more in personal-injury accidents by increasing the number of arrests and convictions.

"Get out and catch real criminals instead of picking on respectable citizens!" This is the attitude of the average motorist whether brought into court or simply warned by the traffic officer. It represents a real challenge. There are three

times as many people killed by "autocides" as by "homicides." If a policeman takes some action which prevents a possible homicide, he is hailed as a hero, patted on the back by the newspapers, and perhaps given a medal, if he doesn't happen to be killed himself, and in that event a collection will be taken up for his widow and children. But if he takes some action to prevent a possible "autocide" he is restricting personal liberty and should be up on charges for insulting a taxpayer who is paying his salary. If he happens to be run over by that same taxpayer it is just too bad, but he should have gotten out of the way.

I have said in a previous chapter, and I repeat again for the sake of emphasis: "Accidents, and particularly street and highway accidents, do not happen—they are caused." The policeman, whether he be a traffic officer at a city street intersection or a member of the state highway patrol riding his motorcycle in all kinds of weather, is the outstanding device for removing these causes. It has been shown that the major cause of motor-vehicle accidents lies in the human factor—the driver who is careless, inefficient, reckless, a road hog, or physically incapable of driving an automobile with safety to himself, his passengers, or the public. It takes a human being to handle this human element.

Automatic traffic control devices have made tremendous contributions to the control of traffic

at intersections, but not because the average motorist has any particular respect for the red or amber lights. It is largely because he can never be quite sure whether he will be observed if he passes a red light, and fortunately this particular violation—passing a red light—is regarded as a particularly flagrant offense, especially by drivers who are moving with the green light. It seems to be the fear of the policeman or the traffic patrol which causes more or less universal obedience to the automatic "stop and go signal" even at rural intersections, rather than a strong desire to abide by the principles of conservative driving.

The same thing is largely true of the road sign, whether it be a warning that there is a dangerous curve ahead providing a good place to commit suicide, or an advice to the motorist that if he exceeds a certain speed limit he will have a chance to see the inside of a jail. There must be officers—a great force of officers—to enforce the traffic laws, rules, and regulations, and if these officers do not have the enthusiastic support of the public they represent just so many names on the taxpayers' pay roll that had better be crossed off.

So when we ask the question: "What can the police and courts do?" the first answer is: "Educate the public to the fact that what they are doing is in the interests of the safety of men, women, and children and not in the interests of

some governmental policy of restriction of personal liberty." When it has been shown by the record that the lives of people are at stake, the right of the individual to pursue his way as he pleases, unhampered by "any loud voice of the law," is nil. In New York State there is a law on the statute books (the Sullivan law) which forbids even the ownership of a revolver without a permit. It is a "dangerous" weapon and permits are not easy to get. The automobile, as a cause of fatalities, has been shown to be three times as dangerous as all of the agencies of homicide combined. If the public is to have the use of it indiscriminately, our police departments have the right to demand the backing of the full force of public opinion in enforcing those rules and regulations for its use, which will remove it from the class of dangerous weapons and keep it in the category where it belongs—one of the greatest conveniences ever devised by mankind for a civilization which seems to be always in a hurry.

Police departments throughout the United States have spent much time and money in studies of this whole question of street and highway accidents, and the best way to reduce accident frequency and severity. To those who are sufficiently interested in this phase of the subject to pursue it further, I earnestly recommend the report prepared for the Special Committee of the International Association of Chiefs of

Police and published by the National Bureau of Casualty & Surety Underwriters. It is entitled "The Policeman's Part in the Traffic Accident Problem" and covers the whole subject most thoroughly.

Many unique methods have been utilized by police departments for making the general public "safety conscious" in its use of the streets and highways. One of the most interesting is to be found in Wichita, Kansas. It is nothing more or less than a "public address system" mounted on a police truck with amplifiers which make it possible to hear the broadcaster's voice for two or three blocks.

This truck wanders about the city, stopping here and there, with observers watching the traffic. Suddenly, out of the air comes a loud voice, crying: "That lady in the brown dress standing on the northwest corner and about to pop off the curb will probably be bumped into Kingdom Come if she doesn't cross with the lights, and it will be nobody's fault but her own." Or, "The driver in the green Hupp sedan, license number 1313, is going to get a ticket if he doesn't have a little more regard for other people or for the city's motor vehicle ordinances," and so on.

Amusing? Yes, but mighty effective. Not only is the person so addressed going to remember the experience, but hundreds of other people—drivers and pedestrians alike—are made con-

stantly aware that the police are on the job and that violations of the law, or even carelessness which does not happen to be a violation of the law, are not being overlooked.

Second only in importance to the support and coöperation of the public is the need on the part of the police of traffic engineers and a traffic division. Mechanical signals will never take the place entirely of the traffic officer, although they are a great help and sometimes have certain advantages over officers in directing traffic. Unfortunately, it often happens that they are installed in a haphazard fashion without any factual study of conditions. Therefore, it is sometimes found that they actually increase the number of accidents instead of reducing them. It should be remembered that there are hardly any two street intersections in the country where conditions are exactly alike—only study by experts makes it possible for either the police, or mechanical devices, or both, to handle the traffic at those intersections which are called upon to bear heavy traffic burdens.

Another example of how certain non-police activities affect police departments is to be found in Detroit. In this city, as an economy measure, some 2,000 street lights were turned out. At the end of ten months the night fatalities had increased 23.3 per cent, while the daylight fatalities had decreased 22 per cent. It is hardly necessary to say that the lights were turned on

again. Since about 2/5 of the accidents and ½ of the fatalities occur at night it is obvious that good or poor street lighting affects the police department, and that a traffic engineering agency, by its analysis of accident facts, can help direct the street-lighting program and thus prevent unnecessary burdens on the department.[1]

But the most efficient police force in the world, equipped with the most modern devices for handling traffic, is as helpless as a kindergarten class without the whole-hearted coöperation of the courts. Attempts to enforce the motor-vehicle laws are worse than useless if our judges do not carry on where the police leave off. Nothing is so destructive of the morale of the average traffic officer as leniency on the part of a judge after the officer has brought into court an automobile driver whom he knows, from observation, to be a menace to the public every minute he is driving. Light fines, suspended sentences, cases dismissed, admonitions and scoldings administered to an offender brought in on charges of driving while drunk, or sheer recklessness, or driving on the wrong side of the road, or on any other major charge, leave the traffic officer cold and discouraged, wondering whether it is worth while to make arrests, particularly when, in a majority of cases,

[1]For complete story of the experience of Detroit, see next chapter, entitled, "Brighten the Corner Where You Are."

he has to appear in court against the offender on his own time.

Furthermore, there is nothing which breaks down enforcement more quickly than a low ratio of convictions to arrests. If motorists get the idea they can get out of an arrest, it means very little to them. A recent study in a typical large American city showed that out of 14,659 personal-injury accident cases 88 per cent were discharged. It was further shown that out of 12,379 driving violations 58.6 per cent were discharged. Other studies showed only 6 per cent of the personal-injury accident cases penalized or held for court; only 20 per cent of the property-damage accident cases penalized or held for court; and only 41.4 per cent of the driving violation cases penalized or held for court. On the other hand, Milwaukee, in 1930, convicted 18,319 out of 18,784 arrests, or 98 per cent.

In one of our larger cities a jury exonerated a man charged with driving while obviously drunk, and who had had a serious accident. A few days later a driver was brought before a judge on a similar charge, and the judge dismissed the case on the theory that as long as a jury did not consider driving while drunk an offense he had no right to oppose that point of view. Under circumstances such as these the police can hardly be criticized if they view drunken drivers or reckless violators of the motor-vehicle code with equanimity. Fortu-

nately, their confidence in and respect for the courts was *partially* restored when another judge sent a prominent woman to jail for a year for driving while drunk and leaving the scene of an accident after she had killed a pedestrian.

There is an important question in connection with the whole subject of the police, courts and the traffic problem and this is: Should the traffic officer be required to appear in court on "his own time"? Traffic officers are expected to prepare their cases thoroughly, appear in court against the offender, and nothing should be done to discourage them. This is as much a part of their duties as patrolling the streets and highways, and they should be permitted to go into court on scheduled days on "pay time." Otherwise they have a considerable incentive to avoid making arrests and pushing their cases in courts. The combination of wasted time and futile effort because of complaisant judges is almost too much for any cop.

The most irritating circumstances with which both police officers and judges are confronted are "fixing" and "fronting." A violator gets a ticket, and because he has a friend who is an influential politician the charge is quashed, the ticket torn up, and he goes on his way rejoicing. Or, not caring for the inconvenience (and what to him is wasted time) of going to court, an attorney is allowed to appear for him, accept a small fine or a mild warning, and the incident

is closed. It has been shown that the elimination of "fixing and fronting" *reduces accidents by one third*—can there be the slightest reason for not having some form of legislation which will make it impossible for a violator to avoid appearance in court once he has been handed a summons?

To handle the traffic problem properly special courts with special judges should be organized, with traffic violation bureaus to deal with minor violations, although it is difficult to define what is a "minor" and what is a "major" violation. The most trivial infraction of the ordinary rules of conservative driving may result in a major accident, while from an accident prevention point of view a scraped fender is quite as important as a head-on collision. Furthermore, certainty of punishment is of far greater importance than severity, while the punishment should be fitted to the individual. A wealthy offender does not mind paying a fine, but he most certainly is annoyed by having to spend a few days in jail, and objects strenuously to the inconvenience of having his driver's license suspended for three months. The driver of a commercial vehicle, given his choice, will often prefer a few days in the workhouse to license suspension or revocation, for with the loss of his license goes his occupation.

The so-called "repeater," the driver who has had a series of accidents, presents few difficul-

ties if he is known to be a repeater. He should have his license suspended, and if he persists in his violations, revoked. In England they have a great scheme. There a driver's license is as large as a letterhead. When a traffic officer warns a driver for some minor violation, he makes a note of it on the margin of the license. When a certain number of such notations have been made on the license, the driver receives a summons. Eventually, if he is a persistent repeater, his license is revoked.

There are many things which the police can do in the way of non-police activities. For example, they can play an important part in any program for safety education in the public schools. There is nothing quite so impressive to a class of school children as a big, well-set-up policeman in uniform speaking to them from the teacher's desk—particularly if he happens to be a traffic officer located at a street intersection near the school and with whom they have become more or less acquainted. He can do more toward "getting across" the idea of carefulness without fear than a thousand school teachers or civilian lecturers. He represents specific conditions with which the children come in contact every day, and he has certain things to do in connection with those conditions. Consequently, to them, he knows more about those things than even their parents, and is listened to with much greater attention.

A small boy, driving with his father at night, began to ask him some rather difficult questions about the stars and the heavens, after the manner of all small boys. The "old man" managed to get along fairly well until his young son asked him if God was up there and, upon being told that He was, asked what He did. This was a poser, but the father rose to the occasion and explained that He was watching over all of the people all of the time, taking care of them and preventing, as far as possible, any accident that might happen to them.

"Oh, I know," said the small boy. "Just like Big Jim, the Cop."

CHAPTER XIV

"Brighten the Corner Where You Are"

ACCORDING to the ancient religion of Zoroaster (Persian) the universe was visualized as a great battleground on which Ahura Mazda, God of Light, and Angra Mainyu, God of Evil or Darkness, were forever struggling. Ahura Mazda was the Wise Spirit, the essence of civilization—Angra Mainyu was the Lie Demon, dealing only in evil, filth, and darkness. According to Zoroaster, the culmination of this struggle would be a great fire through which the righteous, or followers of Ahura Mazda, would pass unharmed, but the wicked, or followers of Angra Mainyu, would die.[1]

All of which is not particularly pertinent except to point out that, since man first began to think, light has always been considered as an enemy of death, disaster, and crime while darkness has been looked upon as a willing ally of these enemies of civilization and of the human race.

[1]See *This Believing World,* by Lewis Browne, and *Prometheus, U. S. A.,* by Ernest Greenwood.

Does light actually decrease night accidents? The answer is an emphatic "Yes!" As will appear in the authenticated statements which follow, not only does light prevent accidents which involve an economic loss (as distinguished from injury or death to human beings) but to an even greater degree it reduced the number of accidents which result in personal injury and in death.

After several years' study of the subject and the making of many elaborate surveys, a specialist of one of the largest electrical manufacturing companies arrives at a figure of $275,000,000 as the annual economic loss within cities due to night traffic accidents and crimes that could have been prevented by adequate street lighting. If this figure is even approximately correct, it is a terrible indictment of those officials who are responsible for our many municipal governments. It means not only a tremendous economic loss, but innumerable unnecessary fatalities and a vast amount of unnecessary human suffering.

Of course, says the intelligent reader, he would be bound to reach some such conclusion. He is an official of a great electrical manufacturing establishment seeking contracts for the lighting of city streets and rural highways. Fortunately, we do not have to seek far for confirmation of what is, after all, a most conservative statement.

One of the largest insurance companies, having in mind that it might be quite worth while to find out whether or not inadequate street lighting is a direct cause of accidents, made a survey of 46 cities ranging in population from 100,000 to several million inhabitants, located from coast to coast and from the Canadian line to the Mexican Border. For the purposes of the survey the hours 5 P. M. to 8 P. M. were selected, and the months May, June, July, and August compared with the period October, November, December, and January.

It so happens that these three hours might well be termed the "perilous period" of the day. Winter and summer alike, there exist during these hours conditions of congestion and volume of movement which inevitably contribute to the accident toll unless utmost vigilance is exercised. It is that portion of the day when there is a heavy homeward rush of office and shop workers, as well as movie patrons and shoppers, all moving by trolley, bus, automobile or on foot, to which must be added the rush of late delivery trucking. And this is quickly followed by a reverse movement of mixed traffic caused by persons going out for the evening and to keep social engagements. However, during the summer months it is practically all daylight—the perfect light for traffic—while during the winter months it is dusk or darkness.

During the four summer months in these 46

cities there were, between the hours of 5 P. M. and 8 P. M., 366 fatal automobile accidents and 9,516 nonfatal accidents. But during the four winter months, there happened during this same period of time 794 fatal accidents and 20,644 nonfatal accidents. After carefully weighing the figures to allow for difference in weather conditions, the conclusion has been reached that the number of fatalities due to insufficient lighting was 392, and the number of nonfatal accidents due to the same cause was 10,177. The excess economic loss of the winter period over the summer period for these 46 cities was placed at nearly $32,000,000.

Not satisfied with this survey the same insurance company made a similar survey the following year, taking in 227 cities. The results definitely justified the conclusion that the annual excess economic loss during this three-hour period in winter over summer and due to insufficient lighting is $201,534,000. As this figure does not include the economic loss due to crime, it compares favorably with the first survey.

Finally, this insurance company surveyed its own home city to ascertain the same information —the effect of adequate street lighting upon night accidents. The appropriation for lighting the streets of that city was reduced as of April 1, 1932. During the fifteen months immediately preceding there were 13 fatal night accidents,

but during the fifteen months immediately following there were 18. This is an increase of 38 per cent in number, and also an increase in the rate of accidents per month.

During the next six months there were 15 fatal night accidents in this same town or more than the total number during the 15 months before the lights were curtailed. During the 21-month period from April 1, 1932, to December 31, 1933, throughout the time when the lighting was curtailed, *fatal night accidents increased 80.5 per cent in the rate of accidents per month and 33 persons were killed.* The city did cut down the cost of its street lighting 17 per cent but—was it *worth* it?

Similarly, a committee on street lighting of the Illuminating Engineering Society, headed by Professor F. C. Caldwell of Ohio State University, reached the conclusion that $262,000,000 a year is the economic loss due to unnecessary accidents caused by inadequate street and highway lighting.[2] Here we have three investigators—one an engineering committee, one a large insurance company, and the third a great electrical manufacturer—all with different viewpoints and each approaching the subject with a different procedure, arriving at practically the same conclusions. As a matter of fact, these three surveys are only examples of an

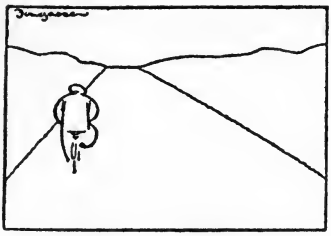
[2]Professor Caldwell includes in his estimate the economic loss due to preventable crime.

enormous amount of data proving conclusively that inadequate street lighting is responsible for a very large percentage of the automobile accidents occurring at night, as well as a considerable amount of preventable crime.

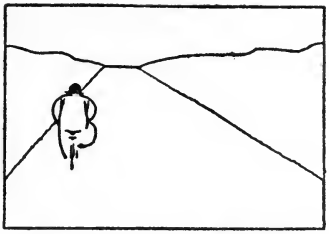
To the city of Detroit goes the doubtful honor of providing conclusive proof that with the reduction of street illumination accidents increase, while with increased illumination accidents decrease. This city, in the interests of the great god Economy, decreased its street lighting 33 1/3 per cent. The results are "illuminating."

Beginning on January 1, 1932, the street lighting was curtailed generally throughout the city. During the first five months there were 23 *more* night fatalities than there were during a similar period in 1931—an increase of 28.8 per cent. An extraordinary feature of this first five months of 1932 is that the day fatalities actually *decreased* 33 1/3 per cent. At the end of ten months Superintendent Louis J. Schrenk reported that the night fatalities had increased 63 per cent over 1931, and that if the 1931 rate had been maintained (when the streets were adequately lighted) 35 lives would have been saved. It did not take the Street Lighting Commission very long to restore the lights.

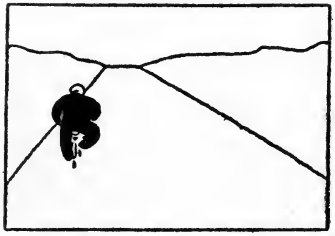
During the first five months of 1933 (when the lights had been restored) there was a decrease in night fatalities of 18, or 16 per cent, although the day fatalities increased during this



One often sees a man bicycling along a road.....



One often sees a man with a black hat bicycling along a road.....



One often sees a man in black clothes bicycling along a road.....

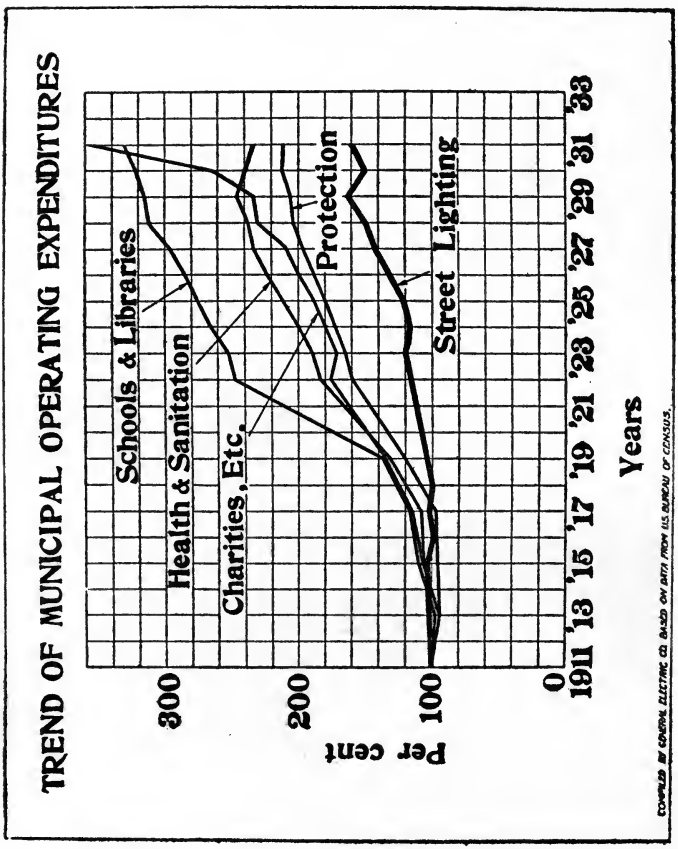
One often sees a man bicycling along a black road.....

One often sees a man bicycling along a road on a black night.....

But I'm hanged if one can see a man bicycling along a black road on a black night in black clothes with a black hat!

A PROBLEM IN MOTORING SAFETY.

DRAWN BY DIRLAND.


TREND OF MUNICIPAL OPERATING EXPENDITURES
Schools & Libraries
Health & Sanitation
Charities, Etc.
Protection
Street Lighting
300
200
100
0
Per cent
1911 '13 '15 '17 '19 '21 '23 '25 '27 '29 '31 '33
Years
COMPILED BY GENERAL ELECTRIC CO. BASED ON DATA FROM U.S. BUREAU OF CENSUS.

period by 40 per cent. The interesting thing is that the 1931 and 1933 totals for day and night accidents are quite comparable. During 1932, when street lighting was greatly curtailed, there was heavy increase of night accidents, although the day accidents were considerably less.

Another extremely interesting bit of evidence is to be found in a letter from J. A. Westlin, chairman of the Schenectady (New York) County Board of Supervisors, to Mr. Kuno B. Shotte, president of the Mohawk Valley Towns Association. Mr. Westlin says:

> We have . . . been able to obtain comparative data on the six miles of the Schenectady–Troy and the Schenectady–Albany highways which are now lighted. The study covered a period of two years before the highway lighting was installed compared with the two years since the highway lighting has been installed. The results are very interesting and show:
>
> Day accidents have INCREASED 13.1%
> Night accidents have DECREASED 40.0%
>
> Since the road conditions remained the same over this period, the lighting must have been an important element in the great proportionate reduction of night accidents, inasmuch as the day accidents showed an increase.

Mr. Westlin applied this ratio of decrease in night accidents to the total number of miles of

lighted highways in Schenectady County. Combining this overall reduction with insurance company figures for the average economic loss from accidents throughout the United States, he reached the conclusion that adequate lighting on these lighted highways was saving the county $105,000 a year. Once more we find accident prevention measures paying actual cash dividends.

In an interesting study of "The Illumination of Interurban Arteries" in *The American City* for September, 1933, there is calculated the loss to New York State of inadequate lighting of rural highways. Using the National Safety Council estimate that at least 35 per cent of night accidents are due to insufficient lighting (the lowest figure of three authoritative surveys) added to the fact that nearly one half of the night accidents occur on rural highways, it is estimated that in New York State alone there are 6,730 accidents on rural highways after dark due entirely to inadequate and insufficient lighting. On the basis of collected statistics the average economic loss of an automobile accident can be said to be approximately $3,000. This means, then, that the state of New York is suffering an economic loss each year of more than $20,000,000 entirely from lack of adequate lighting upon its rural highways.[3] Twenty million dol-

[3]Does not include accidents happening in cities, towns, and villages.

lars a year will build a lot of pole lines, string a good many miles of wire, and pay for an army of kilowatt hours.

But something more than the mere economic loss is involved in these accidents after dusk. In New York State there were 5,381 persons killed in night automobile accidents in 1932. Applying the National Safety Council ratio of 35 per cent we find there are approximately 1,900 fatalities a year caused solely by insufficient lighting. I will leave it to the reader to calculate the value of these 1,900 lives which are snuffed out each year solely because the New York State authorities fail to supply that simplest of all safety devices—light.

Governor A. Harry Moore, of New Jersey, in discussing "Lighting and Taxes," observes: "During the past several years sufficient information on this vital subject has been collected to prove to the most cold-blooded financial analysts that drastic reductions in street lighting cannot be made without a greater loss to the community at large than was thought to be saved by the budget reduction."

The Governor adds that in New Jersey 50 per cent of the fatal accidents are after dark, and it has been estimated that 44½ per cent of these accidents are caused by lack of adequate illumination. In Morris County alone, "main roads unlighted and without sidewalks or paths form the basis for a good percentage of the large num-

ber of fatal accidents that occurred in 1933. There were 50 persons killed in automobile accidents in that county that year, and at least 19 of these were pedestrians, while 24 of the accidents occurred at night."

Commissioner Charles A. Harnett, of the New York State Bureau of Motor Vehicles, points out that of the 2,709 fatal traffic accidents occurring in New York State during 1933 there were 117 that happened at dusk and 1,308 that occurred after dark. The proportion of these accidents—accidents in which people were killed—occurring during dusk or darkness was thus more than one-half of the total.

"Our statistics show," says the Commissioner, "that about one-half of these night fatalities involve pedestrians—unfortunate individuals who are killed while walking on the highways. The great majority of these tragedies happen because drivers fail to see the victims until it is too late. . . . I believe that there are available a number of projects which, although they would call for the expenditure of public funds, would, without doubt, eliminate half of the motor hazards, and thereby cut highway fatalities to a marked degree. Of these, I deem proper lighting of streets and highways the most important."

In similar vein Commissioner M. A. Conner, of the Connecticut State Motor Vehicle Department, says: "The cost of providing a walk by the side of our highways for pedestrians may be

prohibitive, but it seems that better lighting not only would provide the benefits desired but can be installed at a reasonable cost and produce the desired results.

"In our state last year, 478 persons were killed on our highways in automobile accidents. Of this number 261, or more than half, were pedestrians and of the 261 pedestrians killed 181, or about two thirds, were killed during the hours of dusk or darkness. Better lighting facilities would unquestionably have reduced the number of pedestrians killed, but would also have reduced accidents proportionately."

These pertinent comments by officials are significant in their unanimous disclosure that a large proportion of fatal accidents happen at dusk or after nightfall, and that one-half or more of the persons killed in such accidents are pedestrians, whose lives would probably have been saved had the road been properly illuminated.

One can go on almost indefinitely quoting from surveys, investigations, and studies made by both public and private agencies all over the United States during the past few years. The evidence is overwhelming, and certain conclusions are inescapable. For example:

It has been pointed out that 5 out of every 100 persons killed in automobile accidents were killed in the twilight zone between the passing of daylight and the fall of night, while 42 out

of every 100 fatalities occur during the night-time. In other words, 47 out of every 100 fatalities occur after daylight has failed. In the 1933 reporting area, 58% of all fatal motor vehicle accidents occur in dusk or darkness.

But the night exposure is very much less than the daytime exposure, for the very good reason that automobile traffic is very much less at night than during the day. Some engineers have estimated that 90 per cent of the traffic is during daylight and 10 per cent during the night. Others that 80 per cent of the traffic is during the day and 20 per cent during the night. Accepting this latter figure, it has been stated:

> If one fifth of the traffic results in more than 47 per cent of the fatalities (or nearly one half) our chances of being killed at night per car hour are approximately 4 times as great as they are during the day-time. The night hazard is 400 per cent of the day hazard.

Disregarding the rural highways, what does this mean in terms of village, town, and city street lighting? Fifty per cent of all accidents occur within cities and 47 per cent of them at night. The most conservative authoritative estimate places the number of night accidents due to insufficient lighting at 35 per cent. In other words, our cities are suffering an economic loss of $205,000,000 due to preventable night accidents, to say nothing of the loss of thousands of

lives and the suffering caused by hundreds of thousands of unnecessary nonfatal personal-injury accidents. Yet the total expenditure for all of the street and highway lighting in the United States is considerably less than $100,000,000 a year.

It must not be forgotten that the benefits of street lighting are by no means confined to the prevention of traffic accidents. It is the greatest possible deterrent to crime—"a street lamp is as good as two policemen." The most striking examples of the importance of street lighting in preserving community safety comes when by accident or otherwise all street lights are out for a period of time. For example, in Chicago, during the war, an attempt was made to reduce coal consumption by turning off the street lamps. The following headlines appeared in various Chicago newspapers during the next two or three days: ELECTRICITY THE SILENT POLICEMAN—CHICAGO DARK: BANDITS BUSY—THIRTY-TWO HOLDUPS AND MANY OTHER CRIMES IN TWO-DAY PERIOD — MAYOR'S MOTOR STOLEN — STREET LIGHTING TURNED OFF TO SAVE COAL: TURNED ON TO SAVE PEOPLE.

We have many examples of false economy on the part of our municipal, township, county, state, and federal governments—none are so striking or so far-reaching in effect on the com-

fort, convenience, and actual safety of the public as inadequate street and highway lighting. We spend billions of dollars on our streets and highways because, so it is said, the automobile has forced those expenditures upon us. Why not a few hundred millions spent on making those same streets and highways as safe at night as they are in the daytime? Can there be more than one answer to the question?

But it is not only on the streets and highways where faulty illumination is the cause of many fatal and serious nonfatal accidents. In industry it is frequently the proximate cause and often the contributing cause. According to W. Dean Keefer, director of the Industrial Division of the National Safety Council, the completion of certain studies which are being made may indicate

faulty illumination as the proximate cause of, say, 5 per cent of all industrial accidents, and as a contributing cause of, say, 20 per cent of all industrial accidents. These estimates, though not as favorable for the illuminating engineer's purpose as the figures usually quoted, still indicate that faulty illumination is a definite factor in accident causation, and any money which an industrial executive can spend in improving the illumination in his establishment could be justified on a humanitarian basis. In fact, any improvement which will prolong life, decrease misery and suffering among workers and their families, is very much worth while.

In addition to the fact that proper lighting is an industrial accident preventive measure, it helps to preserve the health and promote the comfort of the worker. In an address before the Conference on Economics of Applied Lighting, Case School of Applied Science, Mr. Keefer said:

From the standpoint of fatigue: It is estimated that one quarter of the consumption of bodily energy is due to seeing, even with adequate lighting and normal eyesight. Thus, when the lighting is improper or inadequate, the consumption of bodily energy is unnecessarily increased, and the worker suffers fatigue more quickly than should be the case. Although fatigue cannot be expressed quantitatively, extensive tests which have been made indicate not only that good lighting protects the individual through his ability to see better and more quickly, but that it also, by reducing fatigue, keeps him more active and alert. For example, an automobile driver commonly grips the steering wheel tighter when driving in a fog or at night on a poorly lighted highway than on a well lighted one. In other words, an inadequacy of illumination is manifested in the useless expenditure of muscular and nervous energy.[4]

The fact is that from the standpoint of safety this matter of "seeing" may affect both the physical and mental welfare of human beings in two

[4]For chart showing the relation of lighting cost to capital assets of the manufacturing industry and production cost, see Appendix V.

ways: (1) Imperfect seeing produces a direct possibility of accident on the streets and highways, in the home, the factory, or almost anywhere else, and (2) Difficulty in seeing saps nervous and muscular energy and may result in impaired health. The resulting tired or ill condition is a definite accident hazard.[5]

In fact, the sense of sight is probably the most important of all our senses. Messrs. Oday and Rodgers tell us that "estimates made by various individuals from time to time" indicate that

> 85% per cent of one's impressions are received through the sense of sight and that sight impressions are 22 times stronger than impressions received from any of our other senses. We are told that 70 per cent of our muscular activity is controlled or motivated by the sense of sight and that the process of seeing consumes 25 per cent of our bodily energy under average conditions.

One could write more than one book on this subject of adequate lighting without fully covering the subject. When we consider that millions of schoolchildren are spending hours daily in school buildings in which the illumination is so inadequate that many of them will be doomed to go through life with permanently impaired eyesight, thus increasing their liability to accident in the future—that millions of families are

[5] *Proper Lighting as It Relates to Safety,* by A. B. Oday and Alston Rodgers.

spending their evenings in homes not properly lighted—that most work is carried on in buildings that cannot be illuminated by daylight adequately—that a very small percentage of the mileage of our streets and highways are safe for night driving—and that these facts have a very direct bearing on the accident frequency and severity rates—then we must appreciate that this whole question of adequate and proper illumination is one of the most important with which the American people have to deal in any program of conservation of life and health.

CHAPTER XV

Some Observations

SUPPOSE that when these United States entered the World War every community in the United States had decided to make its particular part in said war its own business without regard for what the rest of the country might be doing or contributing.

To go a bit further, suppose that every organization within a given community—the chamber of commerce, the local luncheon clubs, the women's civic association, the parent-teachers' organization—adopted its own particular program. The chamber of commerce decides to send a few generals and colonels and a stock of whatever commodities which happened to be manufactured within the district. The local women's club contributes a few nurses—trained or untrained—resplendent in uniforms of their own design. The luncheon clubs chip in for an ambulance or two equipped with drivers, spare tires, gasoline, etc., and painted quite nicely in the club colors with the club insignia on both sides. The parent-teachers' association holds

weekly parties for the purpose of raising money for cigarettes, chocolate, and socks for the boys which it insists on sending direct to France rather than through the local Red Cross.

Everybody gives out news releases announcing their pet programs, and nobody pays any attention to what anybody else is doing. Each organization sends its own men and supplies to Hoboken with instructions to beat the other organizations to the first ship sailing for Europe —it doesn't matter just where as long as it is in Europe. Half a dozen units—squads, companies, or battalions—leave for the front, if they can find it, their only orders being to crash the gate of this war and win it for the glory of the organization financing the program.

The A. E. F. would have given one of the grandest shows ever put on in the history of warfare but effective only in that it managed to get in everybody's way.

Sounds silly, and, of course, it is silly. No community and no organization in any community would even dream of such a thing. When the nation went into the war, it went into it wholeheartedly as a unit, with everybody taking orders from Washington, where the whole nation was being organized without regard to creed, race, wealth, or social status. The credit for what we accomplished in the World War belongs to the nation as a whole for its unanimous response to the call of the President,

and not to any one individual or organization. With the Regular Army in charge of recruiting a great expeditionary force, the Navy to get it to France, and American industry and labor cooperating to turn out the munitions and supplies for them, America functioned like a well oiled, highly perfected machine.

But, silly as it sounds, the opening paragraphs describe exactly the way the war on accidents is being conducted in too many American communities today. We have seen that the annual death toll due to accidents is almost twice as great as the number of members of the A. E. F. who were killed in action or who died of wounds. We have seen that the yearly economic loss is at least 40 per cent of what the World War cost the United States. We have seen that in fifteen years of peace times we kill by accident more than four times as many men, women and children as were killed in the fifteen years in which we have been engaged in six major wars.

Yet in a majority of our cities, towns, and villages there is little or no coöperation between local organizations in the war on accidents, and certainly little or no coöperation with the national safety movement *per se.*

Somebody gets hold of a news story, a report, or hears a talk over the radio telling how many men, women, and children have been killed by accidents during the year, how many have been

permanently disabled, and how many temporarily injured. The chamber of commerce, a luncheon club, the women's club, or all of them get all steamed up about it. A committee on safety is appointed. A half dozen committees on safety are appointed. The mayor and the chief of police give out interviews and make speeches. Traffic surveys are made by people having no experience in making traffic surveys. The parent-teachers' association decides that safety education is a good thing and puts it up to the board of education to find out what to do about it. Every organization has discovered a new objective—a new activity.

Eventually each organization produces some kind of a program for reducing street accidents. The only relation that they bear to each other is that they are usually unanimous in their criticisms of the city authorities and the police department. There has been no attempt at cooperation or coördination. Everybody has gotten in everybody else's way, nobody has discovered the front line of this war on accidents, or, if they have, they have failed to recognize it. Nothing happens. A good time has been had by all, a lot of speeches have been made, and the publicity minded have added a few clippings to their personal scrapbooks.

Which brings us up to the thesis of this concluding chapter: The only way to reduce accidents—motor-vehicle accidents, industrial

accidents, home accidents, or any other kind of accidents—in any community or in the nation as a whole is by community organization under some central head, and not by independent action of half a dozen or more independent groups. This is not conjecture or editorial opinion. It has been proven over and over again. No chamber of commerce, labor union, luncheon club, or civic organization can be said to represent the community as a whole or to be equipped to deal alone with such a problem as affects every man, woman, and child in the community. Even the city administration cannot be said to do so, for, after all, it represents a political party, and those of opposing political faith will not rally around it with any enthusiasm. If the accident situation in any given community is to be improved, and an efficient safety program carried out, all of these interests and activities must be brought together under one responsible neutral head or group which can truly be said to represent the community as a whole.

It is, perhaps, unfortunate that the phrases "accident prevention" and "safety programs" mean, to a majority of the people, street and highway accidents. This is due in a large measure to the almost universal use of the automobile and the public character of the hazard. An accident in the home or in an industrial plant seems to be a more or less private matter demonstrating a hazard involving only a small group. But

an accident on the streets is a public matter. It quickly draws a crowd. It demonstrates an existing hazard which everybody in the community must face every day, once he steps outside his home. If a man falls off a stepladder in his own home and breaks a leg, the incident has very little news value unless he happens to be the mayor or the president of the bank. But if an automobile knocks a pedestrian down and breaks his leg it makes front page in the local paper. The stepladder in the individual's home is his own personal hazard, but the hazards on the streets and highways are, unfortunately, the property of all of us.

But "community safety" means a great deal more than the improvement of traffic conditions. It means safety from all kinds of accidents: in the local factories and commercial houses; in the schools and on school grounds; in the home; on the street cars and buses; in fact, within and without every building which together with streets, parks, school grounds, swimming pools, recreation centers, and what not, go to make up the community as a whole.

One of the first conclusions of the average citizen not entirely familiar with the implications of the accident situation is that industrial safety is entirely a matter for employers, workers, and the insurance companies—that street and highway safety is a matter for the police—that safety in and around the schools is a matter

for the board of education—that safety in the home is a matter for the individual and no one else's business. This is a fallacy frequently serving as a stumbling block for the right kind of community safety organization. Nothing could be further from the truth.

An accident in the home—particularly if it is a fatal accident—affects industry because it affects in many ways the employer of the home owner, the schools if there be children in the house, and most certainly the community as a whole if there is a loss of income which means a destitute family. An accident in or about the school affects many groups besides the board of education. An accident to a truck affects not only the truck driver and his employer but many other persons whose property or lives may be involved. In fact, every accident is distinctly a community matter whether we realize it or not, and any war on them must be dealt with as a community matter just as our participation in a war with another country must be treated as a national matter and not by individual action by different groups of citizens.

This brings us directly to the question: "What are the groups in a community which, if brought together under a well planned, coöperative program, will most truly represent a cross-section of community life in work of this kind?" These are:

1. Men having a public responsibility for

accident prevention such as the mayor, the commissioner of safety, the chief of police, the chief of the fire department and the health officer.

2. Men who have an economic interest in the accident prevention problem such as the president or general manager of the street railway company, taxicab companies and bus companies; representatives of industries, retail merchants, and automobile dealers, and the representatives of insurance companies.

3. Public-spirited citizens and representatives of community organizations such as the chamber of commerce, labor unions, automobile clubs, women's clubs, and parent-teachers' associations.

4. People and organizations with facilities to assist in the promotion of safety activities such as the school authorities, the churches, luncheon clubs, boy scouts, girl scouts, the American Legion, the Red Cross, and a great variety of civic organizations.

Assuming that an accident situation exists in a community, that the people of the community have a proper knowledge of what is being done to meet the situation, and that these four groups are willing and eager to join in any movement to reduce the frequency and severity rates of all types of accidents, what type of community organization will be the most effective?

First of all, the community must have an organization which is actually representative of

all of these groups and therefore representative of the whole community. For want of a better name I will call it the local safety council. Such councils, where they have been established under one name or another, seem to divide themselves into three groups: (1) Those in the larger cities where a full-time experienced manager is employed to carry out the program; (2) those in medium-sized cities where a part-time manager is employed; and (3) those in small cities and towns where the effort must be entirely voluntary.

Naturally, at its inception the proposed local safety council, or safety committee, or whatever it may be called, must be sponsored by someone. In some cases it is the mayor, in others the local chamber of commerce, and in others some local organization which has been particularly active in civic affairs. Once some individual or organization has decided to sponsor such a movement, it is time to call in outside, experienced help.

Probably the outstanding institution which is most experienced in this work of community organization is the National Safety Council, although the casualty insurance companies have also done a great deal of it. The council has established 51 active community councils in as many leading cities of the country which, while chartered by the National Council, are managed and financed locally. It is always possible, how-

ever, for any local council or safety committee to secure the full coöperation of the National Safety Council and the benefit of its twenty years of experience in safety work on a national scale whether it is chartered by the National Council or not. The same thing is true when it comes to the coöperation of the insurance companies, for they have a stake in every community and are highly skilled in devising programs for the improvement of the accident situation.

To be all inclusive, the program of this local safety organization or council must deal with many types of work such as, Public Safety in general, Industrial Safety, Child Safety, Home Safety, Fleet Safety, and Fire Prevention. Every activity need not be started at once, but this should be the ultimate objective. As good organization practice there should radiate from the governing board standing committees for each of the major divisions of the work.

Full coöperation of the local press is essential. Work of this kind, affecting as it does the whole community, depends for its ultimate success upon the fullest kind of publicity. It is the only way in which the support of the men, women, and children who make up the community can be secured. It has been found that the press invariably throws itself wholeheartedly into campaigns of this kind and seems to be willing to give almost any amount of space to it

once the editors and publishers are convinced that it is a real community movement and that the work is being conducted along scientific lines with good chances of success. A newspaper will support a coöperative community movement where it may be reluctant to give much space to some pet program of a private organization—which is another reason for operating on a representative community basis.

Community organization for safety is not only one of the mediums of approach, but the best medium of approach to the solution of this terrible accident problem. With every hamlet, village, town, and city in the United States working on such a coöperative basis and determined to reduce accidents in their own communities, the lines on the statisticians' charts illustrating accident frequency and severity will begin to bend downward instead of proceeding steadily upward as they are doing at this time. There is no form of community activity which is quite so worth while.

APPENDIX A

Authorities differ as to the economic loss due to occupational accidents (wage losses, medical expense and the overhead cost of compensation insurance) but it has been placed at $10,000,000,000 by the Engineering Department of the National Bureau of Casualty and Surety Underwriters. A careful and detailed analysis of 75,000 personal injury industrial accidents indicates that the intangible loss—spoilage of material, injury to machinery, the general slowing down of processes, etc.—to be about four times this amount which means that the actual cost of industrial accidents is about.....	$5,000,000,000
The National Safety Council estimates that the wage loss, medical expense and overhead cost of insurance in connection with 1933 fatal and non-fatal injuries in motor-vehicle accidents at about $680,000,000. The intangible losses are at least three times this amount bringing the cost of automobile accidents up to more than	2,500,000,000
The cost in wage loss, medical expense and overhead cost of insurance of home accidents amounts to about $550,000,000. It is difficult to estimate the intangible losses but they must be at least twice this amount making the total cost	1,650,000,000

Balance to cover the cost of transportation and public accidents other than motor vehicle $950,000,000

Total $10,000,000,000

APPENDIX B

The National Conference on Street and Highway Safety

Some time during November or December of the year 1923 the late C. I. Hitchcock, at that time publisher of *The Insurance Field,* was visiting the author in his home in Washington and the conversation turned to the rapid increase in motor-vehicle accidents, Mr. Hitchcock venturing the prediction that if something wasn't done to check them, automobile insurance premiums would go "skyrocketing" and soon reach a point where a great many automobile owners would not be able to afford this form of insurance.

"Do you know," he said, "I have been watching the progress of Secretary of Commerce Hoover's Elimination of Waste Program with a great deal of interest but it seems to me he has over-looked a big bet and left out an important item of his agenda. How about this tremendous waste in human life, human suffering, to say nothing of the tremendous property loss due to the automobile?"

Neither of us realized it at the time but with that question the National Conference on Street and Highway Safety was born. Gathering together some statistics the writer called on the Secretary a few days later with the suggestion that he create a new organization as a special activity of the Department of Commerce having for its purpose a comprehensive study of the street and highway situation with a reduction of motor vehicle accidents as its main objective. The following week the Secretary sent for the late Mr. Elliot Goodwin, at that time Resident Vice-President

of the Chamber of Commerce of the U. S. A., Mr. Louis DeBlois, President of the National Safety Council and the writer. At this conference the organizations presumed to have a definite interest in the reduction of street and highway accidents were listed and a plan of organization discussed. Mr. Hoover then wrote to the American Railway Association, The National Automobile Chamber of Commerce, the American Street Railway Association, the National Bureau of Casualty and Surety Underwriters, the American Mutual Alliance, the American Automobile Association, the National Association of Taxicab Owners, the National Safety Council and the Chamber of Commerce of the U. S. A., explained what he had in mind, and asked them to send representatives to a meeting to be held some two weeks later. At this meeting a permanent organization was formed, a budget agreed upon and offices arranged for in the Department of Commerce. Mr. Hoover agreed to act as permanent chairman of the Conference, Colonel A. B. Barber, head of the Transportation Department of the Chamber of Commerce of the U. S. A., was appointed Director, and the writer was appointed Secretary.

At the first general conference held in December, 1924, surveys made by various committees were considered and the need for more definite standards was emphasized. Accordingly a Uniform Vehicle Code for adoption by states was developed and approved by the Second General Conference in March, 1926, as well as by the National Conference of Commissioners on Uniform State Laws and the American Bar Association. In May, 1930, the Third General Conference reviewed and revised the Uniform Vehicle Code, adopted a Model Municipal Traffic Ordinance for municipalities and approved a Manual on Street Traffic Signs, Signals and Markings developed for the Conference by the American Engineering Council. At each of these conferences committee reports dealing with other phases of the general problem were considered and approved.

The purposes of the Fourth General Conference which

was held in May, 1934, were twofold—review of the standards adopted by the Third Conference in the light of subsequent experience and changed conditions, and to stimulate further effort to carry out the policies previously endorsed. In a message addressed to the Conference and delivered through Secretary of Commerce Daniel C. Roper as Chairman of the Conference, President Roosevelt said:

"I am most interested in the National Conference on Street and Highway Safety, which is meeting in Washington under your Chairmanship, with a view to reducing the large number of deaths, injuries and the great amount of property damage caused each year by traffic accidents. It is said that the total dollars and cents loss attributable to traffic accidents exceeds the amount of money the United States pays each year for its public school system.

"The studies being undertaken in an effort to work up uniform traffic codes and regulations, together with the most effective means and methods of reducing traffic accidents and losses are excellent.

"But uniform codes, regulations and systems are valueless unless every individual, including both pedestrian and driver, accepts and fulfills his full share of responsibility."

Copies of the model uniform codes and ordinances as well as the reports of various committees can be obtained by addressing the National Conference on Street and Highway Safety, Department of Commerce, Washington, D. C.

APPENDIX C

NATIONAL BUREAU OF CASUALTY AND SURETY UNDERWRITERS
ONE PARK AVENUE. NEW YORK CITY

WILLIAM LESLIE
Associate General Manager

JAMES A. BEHA
General Manager and Counsel

ALBERT W. WHITNEY
Associate General Manager

CONSERVATION STAFF
WESLEY M. GRAFF
Director Safety Engineering Division
JOHN J. HALL
Director Street and Highway Safety Division
MAXWELL HALSEY
Traffic Engineer
HERBERT J. STACK
Supervisor Child Safety Activities

March 6, 1933.

Dear Sir:

I suppose every municipal and state authority in the country is concerned with the problem of bringing about such economies as may be possible.

I am writing to you in entire sympathy with such a program but in the belief that the experience of the casualty insurance companies may be of value in deciding what economies are real economies and what economies are only apparent and more than counterbalanced by the evils which they induce.

I have particularly in mind three matters - safety education, traffic control and street lighting, on all three of which we have some very definite information and opinions.

1. Safety Education. The decrease in traffic accidents to children is one of the few bright spots in the traffic situation. The difference in trend between accidental fatalities of adults and of children indicates that the lives of 7,500 children are being saved in this field each year and safety education is undoubtedly mainly responsible for this. May I suggest, in such pruning as may be given to educational expenditures, that consideration be given to the actual present value of the different subjects. Safety education is a comparatively recent addition to the school curriculum but it has a higher rank both in educational value and in its direct results than some of the older subjects.

2. Traffic Control. The magnitude of the economic cost of automobile accidents is not generally known and appreciated; it is nearly two billion dollers a year, four times the fireloss of the country and nearly as much as the entire annual cost of our public school system. Such mastery over traffic accidents as we have is to be found very largely in our law enforcement machinery. This is certainly a part of the cost of government that pays for itself many times over and that cannot be given up without incurring losses that will far more than offset the saving.

3. Street Lighting. A similar situation exists with regard to street lighting. Statistics are available showing that any considerable cutting down of lighting has had the effect of increasing both accidents and crime. A number of cities after a disastrous experience with economizing on street lighting during the depression have abandoned the effort to economize along these lines as being not a real economy but an expense.

I hope that these matters may have your consideration and if we can be of any assistance in regard to further substantiation of the facts as noted, please do not fail to call upon us. I should not have had the temerity to bring these things to your attention if they had not been matters that we have actual knowledge of.

Yours respectfully,

Albert W. Whitney:MBW

Associate General Manager,
in Charge of Conservation. A7/336

APPENDIX D

Motor Vehicle Deaths in 1932, Distributed According to Place and Type of Accident, and by Age of Person Killed. (See Section 33)

Type of Accident	ALL AGES	0-4	5-14	15-64	65 and Over
Total Urban and Rural*					
Total	**29,450†**	**1,230**	**2,940**	**20,760**	**4,520**
Collision with Pedestrian	12,850	980	2,110	6,570	3,190
With other motor vehicle	6,760	130	270	5,730	630
With railroad train	1,520	30	80	1,290	120
With electric car	320	0	20	280	20
With bicycle	290	0	130	140	20
With horse-drawn vehicle	260	0	20	190	50
With fixed object	3,160	20	80	2,870	190
Non-Collision	4,290	70	230	3,690	300
Urban Districts*					
Total	**11,070**	**520**	**1,260**	**7,150**	**2,140**
Collision with Pedestrian	7,150	470	1,040	3,760	1,880
With other motor vehicle	2,040	30	70	1,780	160
With railroad train	380	10	20	320	30
With electric car	190	0	10	170	10
With bicycle	150	0	70	70	10
With horse-drawn vehicle	40	0	0	40	0
With fixed object	680	0	20	630	30
Non-collision	440	10	30	380	20
Rural Districts*					
Total	**18,380**	**710**	**1,680**	**13,610**	**2,380**
Collision with Pedestrian	5,700	510	1,070	2,810	1,310
With other motor vehicle	4,720	100	200	3,950	470
With railroad train	1,140	20	60	970	90
With electric car	130	0	10	110	10
With bicycle	140	0	60	70	10
With horse-drawn vehicle	220	0	20	150	50
With fixed object	2,480	20	60	2,240	160
Non-collision	3,850	60	200	3,310	280

Source: Approximations of the National Safety Council based on records of the U. S. Census Bureau, state motor vehicle departments, city police departments, etc.

*Urban includes cities of 10,000 population or more; remainder of country is classified rural.

†The exact total is 29,451.

APPENDIX E

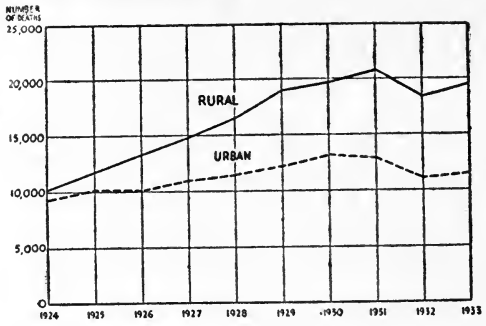


Figure 14. Urban and Rural Motor Vehicle Deaths, 1924-1933. (See Section 36.)

Source: Calculated (later years) and approximated (earlier years) from U. S. Census Bureau data.

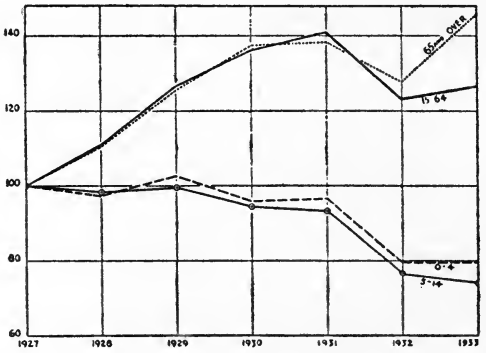


Figure 16. Trends of Motor Vehicle Deaths by Age Groups. (1927 =100.) (See Section 37.)

Source: 1927-1932 calculated from U. S. Census Bureau data. 1933 estimated from state and city reports.

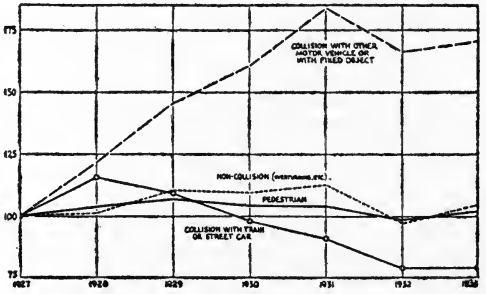


Figure 17. Trends in Types of Motor Vehicle Fatalities. (1927=100.) (See Section 38.)

Source: Train and street car deaths through 1932 based on U. S. Census Bureau data. Other figures based on state and city reports.

APPENDIX F

WHAT DO YOU KNOW ABOUT SAFETY? WHAT CAN YOU SCORE?

NATIONAL SAFE DRIVERS TEST

By HERBERT J. STACK, PH.D.

National Bureau of Casualty and Surety Underwriters,' Lecturer, Columbia and Rutgers Universities.

This test is made up of three parts and requires 15-20 minutes to complete. It is designed to cover the field of highway safety and does not depend upon the variation of existing state motor vehicle codes.

Average Scores		*Your Score*	*Possible Score*
85-90	Intelligent Adult Driver	Part 1	20
80-85	Grade 11-12—Senior High School Driver	Part 2	32
75-80	Grade 8-9—Junior High School Pupil	Part 3	20
		Total × 1.4 = ( )	Total 72 × 1.4 = 100

Name ..... City..... State.....

Grade (High School, Adult, etc.) ..... Do you drive a car?..... No. Years .....,

Part 1.

Score No. Right.....
Possible Score 20.

If the statement is true, make a plus (+) in the parenthesis: if it is false make a zero (0).

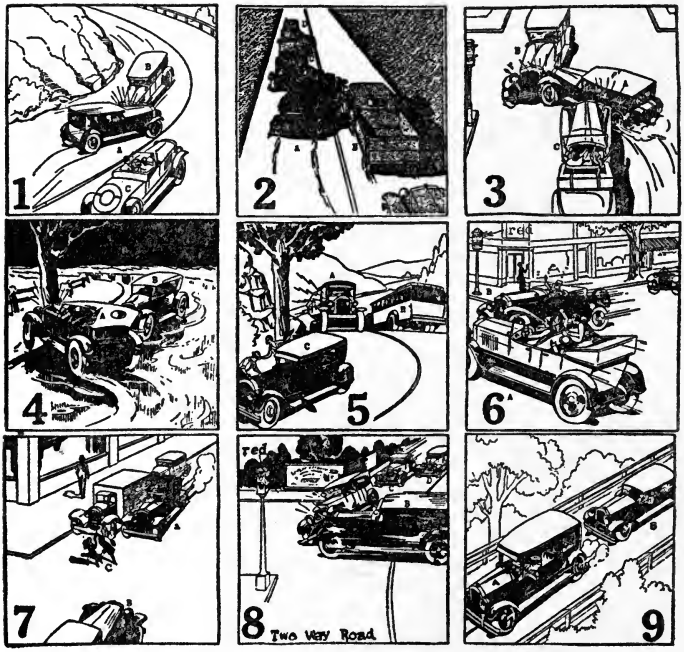
1. When driving in a heavy fog it is best to turn on the dim lights..... ( )
2. Good adjustment of four wheel brakes requires the services of a skilled mechanic..... ( )
3. Since there is greater congestion of traffic at the intersections, it is safer for pedestrians to cross between rather than at the intersections..... ( )
4. Doubling a car's speed from twenty to forty miles per hour increases by four times the braking distance required ..... ( )
5. There are more accidents at night for the number of cars on the road than during the day time for an equal number of cars..... ( )
6. A blow-out on a rear tire is apt to have more serious results than on a front tire..... ( )
7. Having injured a pedestrian along a highway the first responsibility of the motorist is to telephone the police department..... ( )
8. When a motorist approaches an intersection showing a green light at a speed of 45 miles per hour he may cross the intersection without a change in speed..... ( )
9. Most automobile accidents are caused by defective mechanical conditions of the cars..... ( )
10. The only way to reduce public liability insurance rates is to reduce motor accidents..... ( )
11. A driver approaching an intersection should yield the right of way to a vehicle that has already entered the intersection..... ( )
12. A motor vehicle with adequate four wheel brakes going 40 miles per hour should be able to stop in 50 feet..... ( )
13. Gears should never be in neutral coasting down a steep hill..... ( )
14. On rural highways without sidewalks pedestrians should walk on the left side of the highway.. ( )
15. A right turn on a four lane highway should be made from the left side of the right lanes..... ( )
16. More accidents take place on rural highways around turns and at intersections than on the straight away..... ( )
17. As a rule motorists under 20 years of age are safer drivers than those over 40..... ( )
18. When a motorist has a flat tire he can park his car on the highway to change tires..... ( )
19. If a car has new non-skid tires it can stop as quickly on a wet pavement as on a dry pavement.. ( )
20. When a car begins to skid it is best to throw out the clutch and apply the brakes..... ( )

Part 2.

Score No Right..... .....

Violations + Faults. Possible Score 32

Directions: Below are a series of pictures. Each picture shows *one* or *more* violations. The violations are included on the next page, A, B, C, etc. On the next page is an answer blank. In the "Violations" column fill in the letters corresponding to the violations. In the "Fault" column fill in the letter showing the car at fault. (These letters are shown on or near the cars in each picture Follow the directions.) There may be several violations and several cars at fault.



Violations

		Fill in Your Answers Here	
A. Driving too fast for surface conditions of the roadway.			
B. Attempting to pass on a curve with inadequate visibility.	*Picture*	*Violations*	*Faults*
C. Hogging the road.	1	( )	( )
D. Trying to pass with inadequate room.	2	( )	( )
E. Making a turn from the wrong lane.	3	( )	( )
F. Inattention while driving.	4	( )	( )
G. Inattention on the part of pedestrians.	5	( )	( )
H. Driving on the wrong side of the highway.	6	( )	( )
I. Dangerous speed passing parked cars at an intersection.	7	( )	( )
J. Stopping for repairs on the roadway.	8	( )	( )
K. Passing on the wrong side of a car.	9	( )	( )
L. Trying to beat a red light.			

Part 3.

Score No. Right.....
Possible Score 20.

Directions: In each of the statements below three answers are given. One is correct. Put a cross in front of the statement which you think is the best choice.

1. When a fire apparatus comes up behind you as you are driving down the street you should:
   1. Speed up and keep ahead of the apparatus.
   2. Drive to the left curb so they can pass.
   3. Pull over to the right and come to a stop.
2. If your car starts to skid on icy pavement the best thing to do is to:
   1. Throw out the clutch and apply the brakes sharply.
   2. Apply the brakes carefully leaving the clutch in.
   3. Turn off the ignition and apply the emergency brake.
3. When a car approaches from the rear to pass you, you should:
   1. Pull over to the right and give them a chance to pass.
   2. Speed up the car and show them you have a good car.
   3. Pull over to the left and let him pass on your right.
4. On a four lane highway slow vehicles should keep
   1. On one of the center lanes.
   2. On the extreme right lane.
   3. Where they please.
5. The approximate distance that a car traveling 60 miles an hour goes in a second is:
   1. 150 feet.
   2. 90 feet.
   3. 25 feet.
6. You attempt to pass a car on a two lane highway. As you pull out of line to pass, a truck comes around a curve going in the opposite direction, and it appears that you will not be able to pass in time. The best procedure is to:
   1. Pull over to the left and let the truck pass.
   2. Step on the gas and try to make it.
   3. Pull back into line.
7. You are driving down the road and a car side swipes you and speeds ahead. You should:
   1. Try to catch up with him, pass him and make him stop his car.
   2. Get his number and report the case to the police.
   3. Catch up with him and bump him from the rear as he deserves.
8. The best rule to follow driving along a country highway is to:
   1. Keep your speed under 30 miles an hour.
   2. Drive under 40 miles an hour.
   3. Drive at a speed that is safe for the conditions of the highway.
9. The largest number of accidents from the standpoint of the motorist are caused by:
   1. Defective brakes.
   2. Drunken drivers.
   3. Reckless driving.
10. The mechanical defect that contributes to the largest number of accidents is caused by:
    1. Defective steering mechanism.
    2. Inadequate brakes.
    3. Defective lights.
11. The chances that the average person will be involved in an automobile accident which will cause his death or injury in a single year is approximately:
    1. One chance in 500.
    2. One chance in 5.
    3. One chance in 125.
12. You are driving with a party of five people. The driver of the car has been drinking too much. The best procedure is to:
    1. Let him drive and give him directions.
    2. Have someone in the party drive who has not been drinking.
    3. Have the driver arrested.

13. A tire which has given you 20,000 miles of service blows out; the safest procedure is to:
    1. Put on a blowout patch and use the tire.
    2. Have the tire repaired and use it.
    3. Get a new tire.

14. When you put on your brakes the car tends to pull over to the right. This is probably due to:
    1. Defective steering mechanism.
    2. Wheels out of alignment.
    3. Unequal adjustment of brakes.

15. The largest number of accidents due to the fault of pedestrians are due to.
    1. Walking on the wrong side of the road.
    2. Drunkenness.
    3. Crossing between the intersections.

16. The chief function of motorcycle officers is to:
    1. Catch and arrest criminals.
    2. Enforce all traffic regulations.
    3. Keep cars in line.

17. The progressive system of traffic lights is best under many conditions because:
    1. A motorist may drive as fast as he pleases.
    2. A car may move ahead at a regular speed without stops.
    3. It is an indication of a progressive community.

18. In the last five years automobile accidents have tended to increase. The chief reason for this is:
    1. Faulty mechanism of the car.
    2. Disregard for traffic regulations.
    3. Intoxicated drivers.

19. While accidents to adults have been increasing, in the case of children there has been a decrease. This is largely accounted for because:
    1. Fewer children cross the streets.
    2. Children have been trained through safety education.
    3. Children are more intelligent than adults.

20. The number of persons killed on the highways of the United States in a single year is approximately:
    1. 100,000.
    2. 75,000.
    3. 30,000.

APPENDIX G

Deaths from Home Accidents by Type and Age, 1932. (See Section 49)

Type of Accident	ALL AGES	0-4	5-14	15-64	65 and Over
Total	**29,000**	**5,300**	**2,300**	**9,000**	**12,400**
Poisonings (gas excepted)	1,600	550	150	700	200
Absorption of poisonous gas	1,200	50	50	800	300
Conflagrations, burns and explosions	5,700	1,950	800	1,900	1,050
Mechanical suffocation	800	700	50	50	*
Firearms	800	100	100	550	50
Falls	13,700	450	450	3,150	9,650
Other home accidents	5,200	1,500	700	1,850	1,150

Source: Approximations by the National Safety Council, based on U. S Census Bureau records and other data.
*Estimated less than 25.

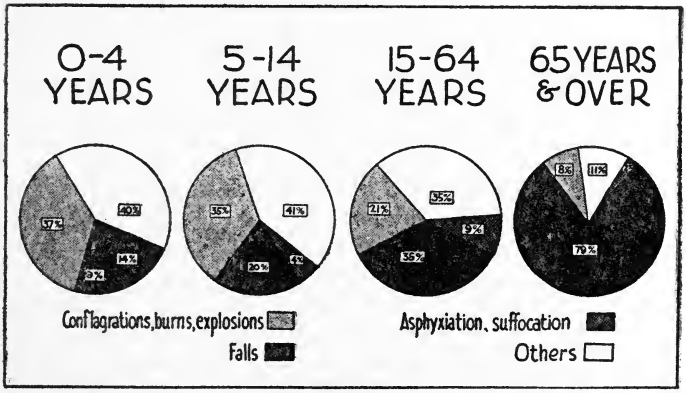


Figure 20. Distribution of Home Fatalities by Age and Type. (See Section 49.) Source: See Table 26.

APPENDIX H

Accidental Injury Rates, by Character of Injury, and by Industry, 1933. (See Section 25)

Industry	Frequency rates				Severity rates			
	TOTAL	Fatal and perm. total	Perm. partial	Tempo-rary	TOTAL	Fatal and perm. total	Perm. partial	Tempo-rary
Total	**14.56**	**.16**	**.63**	**13.77**	**1.59**	**.94**	**.38**	**.27**
Tobacco	1.43	.06	.06	1.31	.36	.34	.01	.01
Cement	4.79	.23	.84	3.72	2.39	1.37	.83	.19
Laundries	5.77	0	0	5.77	.12	0	0	.12
Printing and publishing	5.91	.05	.26	5.60	.47	.32	.07	.08
Public utilities	8.70	.20	.17	8.33	1.53	1.19	.17	.17
Textile	8.90	.02	.39	8.49	.44	.11	.19	.14
Machinery	9.22	.03	.74	8.45	.75	.21	.35	.19
Glass	9.85	.02	.36	9.47	.52	.13	.22	.17
Chemical	10.46	.18	.64	9.64	1.67	1.10	.41	.16
Non-Ferrous metals	11.24	.14	1.24	9.86	1.89	.82	.83	.24
Steel	11.32	.16	.94	10.22	1.91	1.00	.57	.34
Rubber	11.71	.08	.56	11.07	1.09	.46	.34	.29
Petroleum	12.85	.21	.50	12.14	1.89	1.28	.33	.28
Tanning & leather	13.66	.02	.27	13.37	.43	.11	.16	.16
Sheet metal	14.52	.07	1.36	13.09	1.27	.39	.67	.21
Marine	15.11	.20	.59	14.32	2.05	1.20	.40	45
Misc. metal products	15.41	.06	.78	14.57	1.00	.32	.43	.25
Food	15.96	.10	.78	15.08	1.22	.58	.40	.24
Quarry	16.42	1.00	.22	15.20	6.68	5.99	.21	48
Woodworking	18.26	.17	.70	17.39	1.56	1.00	.30	26
Electric railway	19.40	.17	1.29	17.94	1.67	1.00	44	.23
Automobile	19.41	.06	.71	18.64	1.02	.39	35	.28
Paper and pulp	19.47	.13	.93	18.41	1.70	.78	.60	.32
Foundry	22.52	.05	1.07	21.40	1.35	.31	.60	.44
Refrigeration	25.30	.09	.26	24.95	1.33	.53	.22	.58
Clay products	27.10	.09	.37	26.64	1.33	.55	.31	.47
Meat packing	30.81	.09	.90	29.82	1.19	.51	.30	.38
Construction	55.66	.62	1.09	53.95	5.76	3.71	1.19	.86
Lumbering	59.67	.41	1.23	58.03	5.00	2.47	1.36	1.17
Mining	65.28	1.01	1.84	62.43	9.17	6.07	1.50	1.60

Source: Individual company reports to the National Safety Council.

APPENDIX I

THE following are the more important sources of exposure to lead poisoning:

Artists (Commercial); Brass Founding; Bronze manufacture; Cut glass polishing; Colors, manufacture of; Dye working; Enamelling; Glazing; Lead tempering; Lead burning; Lead soldering; Lead casting; Lead refining and smelting; Lead mining; Linotyping; Monotyping; Painters' trade; Plumbers' trade; Pottery trade; Printing trade; Rubber manufacturing; Storage battery manufacture; Type founding; Tetraethyl manufacture.

APPENDIX J

PREVENTION of lead poisoning may be accomplished in the following ways:

1. Use of substitutes for lead, or the less soluble lead compounds.

2. Prevention of the formation and circulation of lead dust and fumes by: (a) Covering dry lead material and free use of water, sprinkling where possible; (b) Substitution of non-dust producing processes for dust-producing ones; (c) Prevention of fumes; (d) Mechanical devices for preventing pollution of the air by lead dust or fumes; (e) Prevention of the accumulation of dust and prohibition of dry sweeping.

3. Special protection of the workers: (a) Separation of dangerous processes from non-dangerous ones; (b) Substitution of mechanical processes for hand processes; (c) Protective clothing, positive pressure masks, and other methods.

4. Medical supervision: (a) Rejection of over-susceptibles; prohibition of women and children in certain processes; placement of employees with predisposing conditions at other jobs; alternating work or reduction of hours of work on dangerous jobs; (b) Regular medical supervision of all lead workers; attention to symptoms indicating early stages of lead absorption.

5. Personal cleanliness: (a) Washing facilities; (b) Lockers for working clothes; (c) Eating rooms and prohibition of eating in work rooms; (d) Prohibition of smoking or chewing tobacco while at work.

6. Personal habits: (a) The importance of good food, emphasis laid on not missing breakfast, a quart of milk daily; (b) Regular bathing, attention to cleanliness of the hair, teeth and finger nails; (c) Regular bowel movements.

7. Education of employees.

APPENDIX K

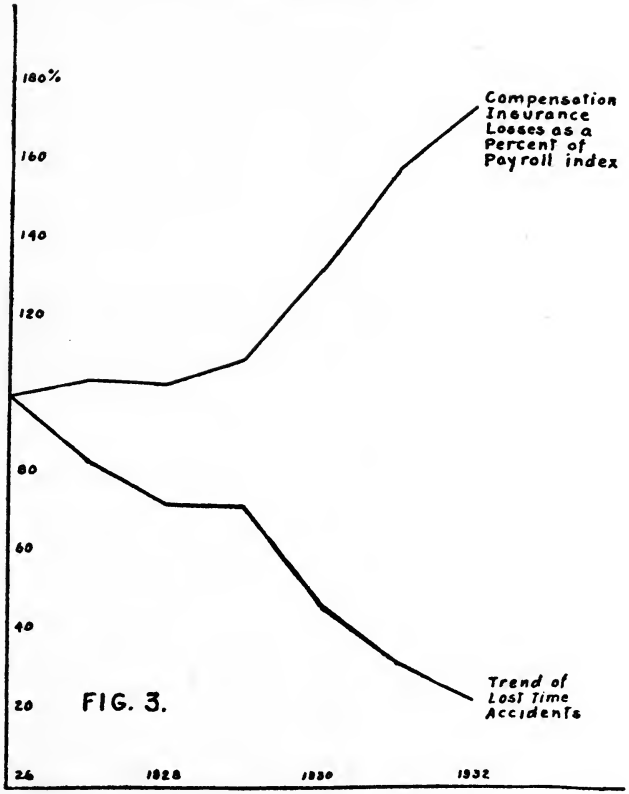


FIG. 3.

APPENDIX L

Fatalities* in Steam Railway Accidents, 1913 to 1933. (See Section 60)

Year	TOTAL	Passengers	Employees	Others** at Grade Crossings	Other Non-Trespassers	Other Trespassers
1913	10,964	350	3,715	1,122	364	5,413
1918***.....	9,286	471	3,419	1,848	332	3,118
1923	7,385	143	2,026	2,217	312	2,687
1924	6,617	153	1,543	2,058	347	2,516
1925	6,766	176	1,599	2,127	337	2,527
1926	7,090	155	1,672	2,394	348	2,521
1927	6,821	82	1,566	2,301	327	2,545
1928	6,509	85	1,327	2,462	348	2,287
1929	6,496	100	1,424	2,379	372	2,221
1930	5,481	50	974	1,893	326	2,238
1931	5,099	41	676	1,707	325	2,350
1932	4,747	28	579	1,435	249	2,456
1933	5,019	50	532	1,438	208	2,791

Source: Interstate Commerce Commission.
*Including only deaths that occurred within twenty-four hours after the accident. Deaths occuring later numbered 415 in 1933. See footnote to next Table.
**Figures in this column are not identical with those in Table 23, because of slightly different classification methods.
***Sum of individual items is not equal to total because of some unclassified deaths.

APPENDIX M

Casualties and Casualty Rates of Employees on Duty, Steam Railway Operation, 1918-1933. (See Section 64)

Year	Total Casualties		Total Man-Hours (thousands)	Casualties per million man-hours*	
	Killed	Injured		Killed	Injured
1918.....	3,048	149,469		No data	
1923.....	1,866	148,146	4,856,964	.38	30.50
1924.....	1,403	120,912	4,473,186	.31	27.03
1925.....	1,460	114,639	4,448,377	.33	25.77
1926.....	1,528	107,218	4,557,637	.34	23.53
1927.....	1,427	83,883	4,406,627	.32	19.04
1928.....	1,187	66,744	4,191,065	.28	15.93
1929.....	1,302	57,164	4,225,292	.31	13.53
1930.....	898	33,184	3,641,412	.25	9.11
1931.....	621	21,417	2,930,657	.21	7.31
1932.....	532	16,359	2,286,561	.23	7.15
1933.....	473	14,482	2,148,527	.22	6.74

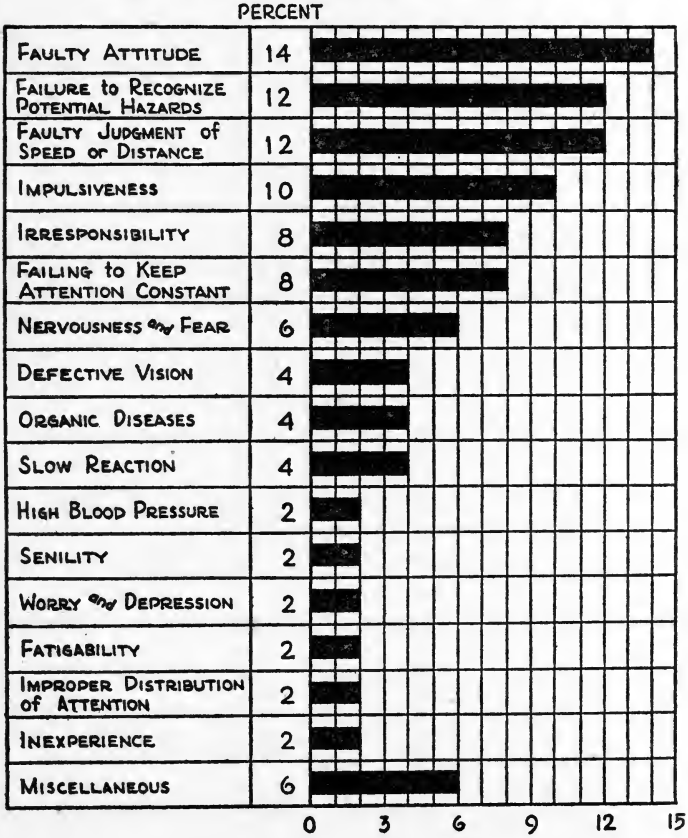
Source: Records of the Interstate Commerce Commission.
*Rates are not comparable with other industrial injury rates shown in this report because of differences in definitions.

APPENDIX N

PRIMARY CAUSES OF ACCIDENT-PRONENESS

Percentage Distribution Among Fifty Motormen

WOODHILL DIVISION, THE CLEVELAND RAILWAY COMPANY



APPENDIX O

Simple Rules for the Use of Matches

Matches should be kept in metal or earthenware containers and well out of the reach of children.

The theory that rats and mice may start fires by nibbling matches cannot be substantiated. They do, however, often steal matches for nest building and being carried through open partitions are frequently ignited by striking plaster or wood.

Great care should be taken with all matches before throwing them away, and breaking them between the fingers is the surest way to know that all fire is extinguished.

Adequate provision for discarded matches and cigarettes would greatly minimize the fire hazard from such causes. Ash receivers should be handy wherever smoking is permitted, but they should not be placed where they might be overturned or where papers might be placed over them.

In lighting a match it is important to strike it away from you so that if it breaks or the head flies off it will not be likely to ignite the clothing. Before lighting matches on boxes or "books" be sure to close the box or paper flap.

When a box of safety matches is placed in a holder the heads should be *downward.*

Matches do not think with their heads. Use your head and put them out.

There is no such thing as an *absolutely fireproof* building.

APPENDIX P

Summary of Reasons for Conflagrations

1. Improper construction: (a) Unprotected vertical openings; (b) Excessive floor areas; (c) Lack of approved shutters or wired-glass in metal sashes for windows;

(d) Wooden shingle roofs; (e) Absence of suitable fire walls.

2. Absence of automatic sprinklers, or sprinklers without sufficient water supply.

3. Inadequate or unreliable city water supply.

4. Absence of fire barriers in the shape of fire resistive buildings, or open spaces, a result of building cities without a plan for preventing the spread of fires.

5. Poorly manned, inadequately equipped and inefficient fire departments.

6. Unreliable or inadequate fire alarm system.

In the elimination of these points of weakness lies the remedy for the conflagration evil. Progressive, conscientious officials of many cities have already taken steps to protect their communities from fire destruction by adopting the safeguards prescribed by engineering science. Delinquent cities should act before it is too late.

"Safeguarding the Nation Against Fire."
PUBLISHED BY THE NATIONAL BOARD OF FIRE UNDERWRITERS, NEW YORK.

APPENDIX Q

The object of the "National Council for Industrial Safety" organized in 1913 (its name was changed to the National Safety Council in 1914) as expressed in the Constitution and By-laws was "to promote the conservation of human life and its incidents in the industries of the nation and to that end:

(1) "To establish a conveniently located headquarters for the maintenance of a clearing house of safety information, available to all concerns;

(2) "To encourage and promote throughout the country the organization of those engaged or interested in safety work into districts and local councils, in affiliation with the National Council;

(3) "To hold Annual Congresses;

(4) "To encourage and assist in the practical standardization of safety devices, safe conditions and practices;

(5) "To give widest publicity, through its own publications and other channels, to all matters calculated to promote industrial safety;

(6) "To initiate, promote, coöperate with and obtain the assistance of all activities or agencies calculated to conserve human life and its incidence in the nation's industries; to participate and aid in other activities for the welfare of the industrial worker of the country."

APPENDIX R

THE National Safety Council publishes five monthly magazines. These are: THE NATIONAL SAFETY NEWS which is the official publication of the Council; PUBLIC SAFETY, issued for public officials, fleet operators, etc.; SAFETY EDUCATION, for the schools; THE SAFE WORKER and the SAFE DRIVER, both issued in the interests of employees of large establishments to further safety, health and morale.

Twenty-three sectional news letters are issued bi-monthly for the different sectional groups.

Three million posters are issued annually in 756 different industrial and public safety units for factories and communities.

Two and one-half million pay envelope inserts and a half million automobile dashboard cards are issued annually.

More than one hundred safe practices pamphlets and health pamphlets have been issued and are accepted as standard engineering works.

The transactions of the Annual Safety Congress are printed and published in a volume of some 1,500 pages.

The Publicity Division prepares feature articles on vital

safety problems of seasonal news interest for the various syndicates. A Trade Magazine Department furnishes material to trade journals. Special radio programs are widely used by stations all over the country.

APPENDIX S

THE National Safety Council is a coöperative association dependent, primarily, upon membership dues for its financial support. Among the industries and other organizations financially able to bear their share of the costs of conducting this national movement the regular services of the Council such as posters and many other publications are supplied to members. In thousands of cases annually, however, information and assistance are freely given outside of the Council membership. This is especially true of the Council's work in promoting highway and home safety throughout the nation.

For the industries, including railroads and public utilities, and also for insurance companies, dues are proportioned to the number of employees or volume of business and the quantity of publications furnished correspond to the amount of dues paid. Several special membership classifications are provided for trade and civic associations and public departments; operators of vehicle fleets; consulting engineers and other individuals, libraries and schools. Special publications are sold in quantities each year to members and non-members at approximately the cost of publication.

The gross income of the Council is approximately $500,000 a year.

Of vital importance in the development of the Council's Education Section and school activities has been the support of this department by special contributions of the National Bureau of Casualty & Surety Underwriters.

APPENDIX T

The Teaching of Safety in the Public Schools

Safety on the Streets and Highways—Elementary Grades

Learn name and street address.

Learn safest route to school and always follow it while going to and from school. This means learning to cross where there are traffic officers, signals, or safety patrols whenever possible; that it is dangerous to take a "short cut" along a railroad track and how to avoid other specific local hazards. (Teachers will use their knowledge of local conditions to make this more specific and to aid children in determining the safest route to school.)

Know the policeman as your friend.

Know the safety patrols as your friends and accept their help.

Learn the meaning of traffic lights: red—stop; yellow—wait; green—go.

Learn to cross the streets at crosswalks: look both ways, obey directions from traffic officer, teacher, safety patrols or traffic lights; walk directly across the street. If the street is very wide, look to the left then step off the curb and walk to the center of the street; pause for a moment, look to the right and then continue to the curb.

Learn to stay on the sidewalks.

Learn to walk on the left side of the road if there are no sidewalks—and well over on the left side, too.

Learn to use care in crossing driveways, alleys, street car and railroad.

Learn how to read simple signs—Stop, Go, Danger, Keep Out.

Play on sidewalks, roadside, playground, park, yard or vacant lot. Be considerate of adults while playing on the sidewalk.

Use roller skates and skooters on the sidewalk. Be considerate of adults.

Avoid running into streets or highways after balls, caps, playmates.

Avoid running from behind street car, bus or between parked cars.

Avoid hitching on street cars, trucks, wagons, farm implements and other moving vehicles.

Learn how to act in school bus: take seat immediately, upon bus; keep books, feet and dinner pails out of the aisles; do not talk with driver when bus is in motion; keep arms and head from protruding from windows; remain seated until the bus comes to a stop. Step down from bus quickly, wait until bus drives away and it is possible to see in both directions if it is necessary to cross the road.

Learn how to use a street car: enter and pay fare quickly and considerately, take a seat if possible and remain seated until it is necessary to leave, step down facing forward, and go directly to the curb.

Remember that a railroad track is always private property and not to be used as a street.

Use the safety zones.

Learn the location of the most dangerous streets and intersections in the neighborhood of your school and home—avoid them.

Do your errands before heavy traffic hours and dusk.

Do not offer anyone a ride on the handle bars of your bicycle.

Refuse rides on handle bars of bicycles.

In crossing railroad tracks look before crossing—cross only when the gates are up.

If crossing is not guarded by gates or watchman, look for automatic safety signal which will tell when train is on a track. If waiting for a slow train to clear the crossing stay on the sidewalk and out of the way of traffic that may start from either side the minute the crossing is clear.

Help older persons on the street.

Ride bicycle down the extreme right-hand curb—all slow traffic keeps to the extreme right is a common traffic rule. If riding after dark, carry a light. Follow traffic directions and rules—do not "run" red lights and so forth.

Learn what public officials are charged with regulating traffic and study their duties and how you may help them.

Ride only on the inside of every vehicle you use—not on the door of a car even though your feet are inside.

Do not walk on high embankments or railroad trestles for a train may crowd you off.

Fire Prevention—Elementary Grades

Matches:

Learn danger of playing with matches.

Learn the value of safety matches.

Learn how matches should be kept in a home—in a container, high out of the reach of small children.

Lamps and Lanterns:

Learn why lamps should have broad bases.

Learn why lamps and lanterns should be cleaned in the day time.

Learn that lamps should never be carried into closets, or left near the edge of a table.

Learn that lanterns should be placed on secure hooks when they are carried into a barn or stable.

Learn the danger of playing with or near lamps and lanterns.

Kerosene and Gasoline:

Learn that kerosene and gasoline should be handled carefully. Gasoline, in particular, should be kept in especially marked containers. Both of them should be stored outside of the house or apartment.

Learn the dangers of pouring kerosene on a fire.

Waste and trash:

Waste, particularly oily waste, should be removed from the premises as quickly as possible.

Learn why dusting cloths should be kept in metal containers.

Learn the danger of storing large quantities of papers and magazines for a "paper sale" or other purpose.

Learn the possible dangers connected with storing waste and trash beneath stairways.

Fire drills:

Learn how to follow directions and remain calm during fire drills.

Learn the value of fire escapes during fire exit drills and the safe way to use them.

Turning in a fire alarm:

Learn how to turn in a fire alarm: when telephoning it is necessary to report street address of fire. When using fire alarm box: break glass, turn key, wait for fire apparatus to arrive and then show the location of the fire.

Smothering a fire:

Learn how to act if clothing is on fire—wrap in rug, blanket or coat and roll on ground or floor. If no covering is available roll over and over on floor or ground.

Escaping from a burning building:

Close doors and windows, place wet towel or handkerchief over face, or place wet handkerchief in mouth and breathe through it, if smoke is very dense crawl along floor, using wall as a guide.

Home cleaning:

Learn the danger of home cleaning fluids—particularly when used in quantity and to clean entire objects of

wearing apparel. Gasoline is explosive. Carbon tetrachloride (available at drug stores) is less explosive but throws off a heavy, poisonous gas. Neither can be used with any degree of safety where the ventilation is not very good.

Safety at Home—Elementary Grades

Playthings:

Learn how to use all toys carefully.
Learn how to care for playthings, so they will not be broken or cause anyone to fall or be otherwise injured.
Learn how to play without injury to others.

Falls:

Straighten rugs so others will not trip.
Avoid climbing on slippery surfaces.
Avoid playing in high places.
Avoid standing on rockers, broken ladders.
Avoid leaning against screens, windows, glass doors.
Avoid sitting on window sills or leaning out windows.

Scalds:

Avoid playing near tubs and pans of hot water.
Avoid reaching for pans of hot liquids.
Aid in caring for small children and keeping them from reaching for pans of hot liquids on the stove, the coffee pot on the table and so forth.

Asphyxiation and Suffocation:

Keep hard substances from mouth—pennies, marbles, rubber balloons, etc.
Learn to recognize the distinctive odor of cooking gas and what to do when it is discovered: open a window so there will surely be ample fresh air, report the leak to the gas company, recognize the danger of looking for a gas leak with a lighted candle, match, lamp or other open flame.

Learn the source of carbon monoxide gas (automobile engines) and the importance of having garage door or window open if engine is running while car is in garage, realize that this gas is unusually dangerous because it has no odor, color or taste.

Electric appliances:

Learn the importance of good electrical appliances.

Learn how to tell a good electric light from a poor one (by the colored band indicating that a particular cord was made according to standards of the Underwriters Laboratories.)

Learn the dangers of playing near electric washing machines, fans and other power-driver equipment.

Poisons:

Learn the danger of tasting the contents of unfamiliar bottles, boxes and cans.

Learn to recognize the poisonous plants native to your community.

Safety in Play and Recreation—Elementary Grades

Selection of Safe Places to Play: Learn the importance of safe places to play—not in street, highway, on high embankments—adjacent to building construction, on fire escapes, and so forth.

Playing Safely:

Roller skates and scooters: Learn to use them on sidewalks, always being considerate of pedestrians. Watch with care when skating or scooting across driveways running across sidewalks.

Coasting: Coast in parks or on streets closed to traffic and blocked at end to prevent coasting into traffic. Make sure that the coasting streets you use are carefully marked or guarded by policemen or safety patrols.

Avoid hooking on trucks and wagons. When returning to the top of a coasting hill, walk on the extreme right on the slide. Avoid following other sleds or toboggans too closely. Avoid sliding under fences, or too close to trees and fixed objects.

Skating: Roller skate on sidewalks or streets closed to play. Ice skate on firm ice only. Be considerate of other skaters. Make sure that holes and weak spots in ice are clearly marked. Avoid skating on rivers with unknown and uncertain currents. Know how to rescue one who has fallen through the ice: crawl forward on hands and knees, pushing forward a stick, board or coat for one who is being rescued to hold on to. When he has been pulled from the water, wrap something about him, make him exercise and get to a house as quickly as possible. Call a doctor so that he may have proper care for immersion and shock. When returning from skating, put skates in place provided for them.

Bicycling: Ride in street or highway. Keep to the right of the street or highway. Ride straight along, omitting the "weaving." Follow traffic directions. Appreciate dangers in catching on street cars and trucks. Have good brakes and horn or bell. Carry a light after dark, or at dusk. Avoid asking anyone to ride on handlebars and courteously refuse requests for permission to do so.

Water Safety: Swim in familiar places with at least one friend. Learn to swim if interested in playing around water. Obey all rules and regulations of bathing beaches and pools. Avoid diving in shallow water. Avoid standing in boat or attempting to change seats. Learn how to adjust a life belt. Avoid becoming too tired while swimming. If swimming a reasonable length of time makes you feel very tired and "funny," have your heart examined. Always avoid stunts that endanger yourself or other swimmers. Aid in keeping bathing beach clean and attractive.

Firearms: Avoid playing with firearms. Always avoid pointing a gun (even a toy gun or cap pistol) at anyone.

Camping and hiking: Learn to recognize poisonous plants and dangerous animals native to your community. Avoid drinking water from streams, pools, lakes or other sources unless there is absolute assurance of safety. If caught in electrical storm, keep away from fences and lone trees. Learn proper way to make a camp fire and the necessity for extinguishing all flame and coals before breaking camp. Learn to dress properly for camping and hiking trips. Aid in keeping camp in good condition. Aid in caring for fellow campers. Avoid tasting unfamiliar berries or herbs while hiking. Stay out of property placarded "Private Property—Trespassing Forbidden." Avoid petting strange dogs.

Taking Care of Play Space: Aid in keeping playground, bathing beach, and camp free from broken glass, rocks, papers and other rubbish and harmful substances.

Playing with the Other Fellow: Aid in taking care of fellow playmate by always being considerate and playing according to the rules of good sportsmanship.

Safety Education—Secondary Schools

This is as yet a relatively undeveloped field. In view of all the circumstances influencing the integration of safety activities into the program of the secondary school, it is, perhaps, wise to stress at this time only the minimum essentials.

Factors Determining Minimum Essentials:

1. Drivers under twenty years of age now have the worst accident records of any using the streets and highways.
2. One third of the accidents occurring to pupils in school buildings occur in gymnasiums, largely in grades above the fifth.

3. Vocational shops are the location of a large portion of the upper grade accidents.
4. The victims of 53 per cent of all deaths from drowning are under 25 years of age.
5. The victims of 52 per cent of the deaths from firearms are under 25 years of age.
6. In 1931, for the first time, accidents became the most frequent cause of death in the 15 to 19 age group.

Conclusions: Secondary school safety programs should be built around:

1. Training the young driver.
2. Protecting and training the young athlete.
3. Protecting students in school shops.

The Young Driver: Experience, observation and accident facts lead to the conclusion that many young drivers, as well as many older ones, need training and opportunities that will give them *experience, judgment and skill* in the management of a motor car in order that they may become truly efficient operators of the modern powerful motor cars.

I. Local and State Traffic Regulations.
II. The Meaning of Traffic Signals.
III. Courtesy in Driving.
IV. Mutual Responsibilities of Motorists and Pedestrians.
V. Taking Care of a Car.

Methods of Organizing Materials for Presentation:

I. *Reaching the Whole School through home room programs,* preferably sponsored by a safety council or a special committee of the student council.

II. *A Drivers' School,* consisting of a series of meetings arranged for the whole student body and planned as an intensive drive. It is recommended that a selected group of students, preferably the Student Council, arrange for this series.

III. *A Motor Traffic Club,* as part of the extra-curricular

program. This arrangement, however, makes it difficult to reach more than a small percentage of the students enrolled in any large high school unless, of course, the club is supplemented by some additional activity such as assembly programs or a Drivers' School. (See pamphlet on Motor Traffic Club.)

IV. A Unit on Driving in Civics or Social Science Courses. (Classroom instruction.)

Athletics and Playgrounds:

A. General Conditions Influencing Safety on the Playground.

1. Size of grounds.
   The size of the grounds necessarily varies with the size and type of school. In "Safety and Health for the School Child," published by the United States Office of Education, Dr. James F. Rogers reports, "One state suggests five acres for elementary schools, ten for junior, and twenty for senior high schools."
2. Location of grounds with relation to surrounding streets and thoroughfares.
   It is not wise to have playgrounds front on heavily traveled streets. Where this is unavoidable, fences should be used to prevent children at play from running into the streets. Older children may be trained in time not to do this, but very young pupils must have definite protection. Rural school children should be discouraged from playing on busy highways.
3. Surface of the grounds.
   Playgrounds should be properly surfaced, drained and kept free of rocks and refuse of all kinds.
4. Supervision.
   Proper supervision insures safety as well as maximum value of play space and periods.

B. Organized Games and Accidents.

A national study of accidents in physical education activities made by Mr. Frank Lloyd, of New York Uni-

versity, and reported in the October, 1932, issue of *Safety Education Magazine,* shows that of 2,370 accidents reported football accounted for 32.5% of the total. Basketball ranked next with 18%.

1. Preventing Accidents in Baseball.
   It appears that the number of accidents in baseball could be reduced by the consistent application of the following simple rules:
   (a) Provide adequate equipment. Good gloves, protectors for the catcher, etc., are particularly important if the regulation hard baseball is used.
   (b) Keep equipment in good condition. Throw away or tape rough-handled bats, etc.
   (c) Provide clear base markings of some soft material or pad into which a player can slide. (Base markings should never consist of pegs driven into the ground into which a player might slide or upon which one might fall with considerable injury to himself.)
   (d) Penalize batters who throw their bats upon making a hit.
   (e) Keep the spectators off the playing field.
2. Preventing Accidents in Football.
   Mr. Lloyd,* whose study has already been mentioned, believes that accidents in football can largely be controlled through the following means:
   (a) Removing equipment hazards.
   Remove extraneous objects from the field, surface the playing field in a condition to insure maximum safety, provide equipment that will adequately protect each player, and provide sanitary locker, dressing and bathing rooms.
   (b) Eliminating hazards growing out of human elements.

*"The Facts of Football," by Frank S. Lloyd, *Safety Education Magazine,* October, 1932.

Make sure that players are in good condition before each game and each rigorous practice; provide trainers and others who know how to care properly for players during the game; work for the selection of good officials; eliminate unbalanced schedules; avoid conditions tending to develop bad attitudes both from the point of view of causing accidents and neglecting proper and immediate treatment of injuries.

(c) Observe principles of football so that the greatest possible number of hazards inherent in the game can be avoided.

C. Playground Equipment and Accidents.

1. Selection.
   (a) Equipment should be sturdily built and of the types to give the maximum benefit to children.
2. Placement.
   (a) Apparatus should be so placed that (1) the use of one piece does not interfere with the use of another, (2) the use of one piece, or any piece of equipment, does not interfere with the use of free space designed for sports and games.
3. Inspection and Testing.
   (a) All playground equipment should be inspected and tested periodically. Needed repairs should be made promptly.
4. Instruction in Use.
   (a) Children should have instruction in the use of each piece of equipment. This instruction may be given by older pupils. It should be definite and deal *specifically* with each apparatus.
5. Comments on Specific Pieces of Apparatus.
   (a) Slides:

   User should slide down feet first, sitting, not standing.

   Hands should be kept on the sides of the slide.

No child should start from the top until the last child to use the slide has stepped away from the bottom.

There should be no crowding or pushing on the ladders.

No one should walk or crawl on the board.

(b) Teeter-Boards:

Children not using the teeter should stay away from it. A child leaving the teeter should give warning to the other child using it. Leaving board, the first child off should hold the board tightly and let it rise gradually so that child on the other end can alight safely.

(c) Giant Strides:

Each child should hold tightly at all times and hold back from the person in front of him. He should give ample warning before letting go. He should not throw the chains backward or forward nor wind them around the pole. He should not place his feet through the rungs of the ladder.

(d) Horizontal Bars:

Bars should be adjusted so that they are the proper height for the child and the stunts he is to do. Spectacular stunts should be discouraged. Use of the bars should be continuously supervised.

(e) Swings:

Only one child should use a swing at a time. He should be seated, not standing. He should not dismount until the swing has stopped. A white line may be used to make a zone around each swing. Children waiting to use swings should remain outside this zone.

The above may not cover completely the problem of protecting children in the use of playground equipment.

As equipment varies from playground to playground instructions and suggestions in its use must vary accordingly.

D. Safety in Unorganized Play.

It appears that the amount of space available and the degree and type of supervision determine to a large degree the safety of children, particularly small children, in organized play. Naturally, as supervision tends to increase organized activities it tends to eliminate this particular problem.

Pupil Accidents in School Buildings:

Fifteen per cent (15%) of the pupil accidents reported in a special study made by the National Safety Council occurred in school buildings. According to these recent special studies, pupils are most likely to be involved in accidents when in the school gymnasium, shops and while using the corridors, stairs and steps. Protection from fire is, of course, of paramount importance in safeguarding children while they are in school.

A. Safety in Gymnasiums.

1. There are many hazards inherent in the type of activities carried on in school gymnasiums. A considerable number of accidents occurring in this portion of the school building can be eliminated, however, by
   (a) Preventing overcrowding.
   (b) Preventing overlapping of class groups at change of periods. The retiring class should leave the floor before the new class comes out and becomes active.
   (c) Not having the floor too highly polished. This is particularly important where school gymnasiums are used for physical education activities during the week and for school dances on Friday nights.
   (d) The provision of mats under bars, horses, etc.

(e) Padding uprights, radiators or other projections against which a participant may fall or be pushed.
(f) Medical examination of all students taking part in strenuous sports or who are members of gym teams and squads.
(g) Prompt first aid treatment of all minor injuries.
(h) Constant supervision.

B. Safety in School Shops.

To Mr. Wayne M. Judy, formerly a graduate student at Iowa State College, we are indebted for the following information on accidents in school shops. Mr. Judy's study covered 249 school shops in Iowa in 1930–31 and 1931–32.

1. Accidents caused by hand tools (listed in order of frequency)
   (a) chisels.
   (b) knives.
   (c) hand saws.
   (d) planes.
   (e) hammers.
   (f) scrapers.
   (g) cold chisels.
2. Machines figuring in accidents (also arranged in order of frequency).
   (a) lathes.
   (b) grinders.
   (c) table saws.
   (d) jointers.
   (e) power drills.
   (f) sanders.
   (g) band saws.
   (h) planers.
   (i) mortisers.
3. Causes of Accidents.
   Pupil carelessness.

Disobedience.
Hasty work.
Improperly guarded machines.
Crowded conditions.
Anger.
Worry.
Working after school hours.
Clothing.

4. Recommendations of School Shop and Laboratory Committee of the National Safety Council:

A complete record should be kept of all accidents to students working in school shops. These records should be studied carefully. They will indicate where accidents are occurring, what machines need special guards, etc.

A student safety engineer should be appointed. His duties would consist of the following:

To see that all neckties are removed or tucked in.
To see that all sleeves are rolled up.
To see that aprons are worn, whenever necessary.
To make sure that students wear goggles at the grinder, the shaper and at the furnace when molten metal is being poured.
To keep flames inside the furnaces.
To supervise the lighting of furnaces.
To set the tool rest on the grinder.
To make sure that tools are kept off the floor, oil is wiped up, oily rags are placed in containers.
To see that there are no mushroomed tools.
To see that no files are used without handles.
To inspect the first aid cabinet.
To see that all cuts are properly dressed.
To make sure that all accidents are promptly reported.

All power driven machinery should be adequately guarded.

C. Safety in the Corridors and on the Stairs.
   1. Frequency of Injury.
      (a) A rather astonishing number of children are injured each year, and seriously enough to be out of school as a result of those injuries, while they move up and down the stairways and steps of school buildings.
   2. Cause of Accidents.
      (a) Poor stairs and steps—poorly constructed, uneven, inadequate lighting.
      (b) Crowding and tripping.
      (c) Haste and confusion.
   3. Prevention of These Accidents.
      (a) Improvement of stairs and lights wherever possible.
      (b) Development, with aid of student committee, of traffic rules for the building.
      (c) Corridor monitors.

APPENDIX T-2

The Minimum Essentails in the Prevention of Fires in Schools*

There are five school fires every day. Each year, particularly during October, we are reminded of this fact and the tragic loss of life and property it indicates. *Boards of education and their chief administrative officers, the superintendents of schools, are responsible for the prevention of these fires.* After a careful survey of data now available, we

*The definite recommendations included herein have been discussed with Mr. Richard Vernor, manager, Fire Prevention Department, Western Actuarial Bureau.

desire to direct the attention of the members of the Child Education Section of the National Safety Council to the following problems:

Building Fire Safety into the School Structure

Geographical location, number of pupils to be accommodated, type of building to be erected, funds available and many other elements enter into the perfection of plans for the erection of a new school building. The large field of school architecture cannot be adequately discussed in a bulletin of this type. We can only advance a general principle bearing on this phase of the subject of fire prevention in schools. *Those responsible for school safety programs are also responsible for making school architects and school board members initiating building programs safety conscious.*

The Need for Fire Safety in Schools

Perhaps the single fact that five school fires occur each day is sufficient proof of the need for definite fire prevention measures in schools. *Some of these fires have resulted in a heart-breaking loss of child and adult life. One hundred and seventy-six pupils and teachers met death when the three-story Collingswood school burned. Thirty-six died when the one-room rural school at Babb's Switch was destroyed by a fire that broke out during a gay Christmas party, to name only two of a rather long list of disasters.* All school fires cause property damage, sometimes running into large amounts. In each of over one hundred of these the damage has exceeded $100,000. All school fires cause *inconvenience* and the *interruption* of the normal activities of one or all of several groups, teachers, pupils, custodians and sometimes parents.

Training in Fire Prevention

If personal injury and property loss are to be avoided in school fires, it seems certain that three groups must be trained, namely, *the custodians, the teachers, and the pupils.* Principals should be made responsible for this training.

I. *Custodians.*

The custodian is an important figure in school fire prevention. Careless and uninformed custodians have caused, or contributed to the causes, of many school fires. They should be made to feel their responsibility for the protection of children and the preservation of the school plant. They should know that the least they can do for fire prevention is to observe the following rules:

1. Keep all exits unobstructed at all times when the building is in use.
2. Aid in making possible the use of fire escapes in fire exit drills.
3. Always keep the fire alarm system in perfect condition.
4. Keep fire fighting equipment in good condition. Fire extinguishers should be inspected at regular intervals (to make sure that the outlet has not been closed by corrosion) tested and recharged, if necessary, at least once a year.
5. Dispose of waste materials and waste paper properly.
6. Keep janitor's quarters clean.
7. Store supplies and equipment in regular storeroom, not in the attic or under the stairs.
8. Request annual inspection of building by those competent to do a thorough job, particularly in the inspection of electric wiring.
9. Urge observance of regulations governing film pro-

jection, the use of candles, paper decorations, etc.

10. Know the location of the nearest city fire alarm box.

II. *Teachers.*

Teachers should be thoroughly familiar with the needs and requirements of the children but also aware of the problems of the custodian and his efforts to prevent fires. Teachers should observe the following suggestions at all times:

1. Observe the state laws with regard to type and number of fire drills.
2. Post cards of instruction or direction for drills in all classrooms at all times.
3. Know how to use a small hand fire extinguisher.
4. Be informed on the location of the following: the nearest rug or fire blanket for use in smothering a small fire, the nearest city fire alarm box, the nearest hand extinguisher.
5. Observe regulations concerning projection of motion picture films, the use of paper for decorations, etc.
6. Coöperate with the custodian in the prevention of fires.
7. Teach fire prevention at reasonable intervals throughout the year.
8. Utilize fire exit drills to teach children the great need for calmness in emergencies.

Pupils, teachers, and custodians should coöperate in fire prevention. This need for coöperation is clearly shown in the making of fire drill regulations. *Nearly every state has a law requiring a specified number of fire drills.* One drill during each school month is a common requirement. The number required by law should be taken as the minimum number of drills. If the state law does not require one a month it is recommended that a number in excess of the law be held.

Recommendations for Fire Drills

Regulations governing fire drills have been developed by the National Fire Protection Association and approved by the American Standards Association. The following definite recommendations are based on the requirements of the standard and should be regarded as minimum essentials:

1. *Drills should be executed during different hours of the day.* Some of them should be held during the changes of classes, assembly and laboratory periods, etc., as well as during periods when the large proportion of the students are in their home rooms or classrooms. Drills should give children experience in leaving the building without difficulty during unusual school activities, for it is possible that an actual fire might occur during such a period.
2. *Children should form in ranks, teachers should take charge of lines.*
3. *Children should not be allowed to secure outdoor clothing.*
4. *Children unable to hold their places in a line moving at a reasonable speed should be taken care of by older pupils.* They should move independently of the regular line.
5. *Monitors should aid in fire drills.* They may open the doors and in other practical ways facilitate the execution of the drill.
6. *Emphasis should be placed on quiet and orderly action during drills.* Speed is important, of course, but is not the most essential characteristic of a good fire drill.
7. *All exits should be used in drills, except in special "closed exit drills."* If children and teachers are not trained to use fire escapes during drills, they will not use them during fires when exits normally used during drills may be blocked with smoke and flame.

"Closed exit" drills are special drills in which, unknown to the pupils, an exit has been closed. Children accustomed to using the closed exit are required to leave the building from another exit with the minimum amount of confusion and interruption of lines normally using the exit. "Closed exit" drills more nearly approximate conditions likely to exist during an actual fire than any other, and are of unusual value because of this.

8. *Pupils leaving the building first should take a position an adequate distance from it to allow those leaving last to find their places a safe distance from the structure, and to allow fire fighting equipment to function properly.*

APPENDIX U

Safety Program of the National Congress of Parents and Teachers

At the Annual Convention of the National Congress of Parents and Teachers held in Seattle, 1933, the following statements outlining the working program were adopted:

"Realizing that accidents are the most frequent cause of death between 5 and 19 years, and that the cost of automobile accidents alone now surpasses the cost of our entire public education system by a quarter of a billion dollars each year, we urge the continuation of safety activities in the home school and community in order that lives and property may be safeguarded. Since drivers under 20 years of age have the highest accident records of any using the streets and highways, we urge that special emphasis be placed on their training and that parents recognize their own responsibility in permitting the use of automobiles by minors."

In an effort to translate the resolutions and other statements of purposes and aims into action the National Com-

mittee on Safety develops, every two years, a program of work. This is for the guidance of the local units. The plan now in effect has the following objectives:

To teach parents how to avoid accidents.

To aid parents in giving the maximum protection to children at home and on the streets.

To aid teachers in giving the maximum protection to children while on school property.

To aid both parents and teachers in the development of safety skills and attitudes among children that will make possible active and adventuresome lives.

To develop in the community a sense of responsibility for child and adult safety.

The activities and projects proposed by the plan include a study of home hazards through home inspections, securing home first aid kits, sponsoring standard school boy patrols, sponsoring high school motor traffic clubs, working for state legislation regulating school buses, prohibiting the indiscriminate use of fireworks and firearms, and the drivers' license law, encouraging first aid and swimming classes and cooperation with community organization actively engaged in sponsoring safety programs.

It is extremely difficult, and perhaps not entirely wise, to select particular projects and seem to emphasize their importance by commenting upon them here. An immeasurable amount of child safety work has been done by Congress units. Some of it has, of course, been more wisely directed, more enthusiastically followed through to completion, than some of the rest of it. The particular undertakings mentioned here are given because they illustrate types and varieties of projects and procedures rather than because they are unquestionably superior to similar work done in other parts of the country.

The Washington and North Carolina branches of the National Congress of Parents and Teachers have been giving particular attention to the conditions and circumstances

surrounding the children who are transported to school by bus. Two hundred and sixty thousand children are transported to school by bus daily in these two states, two hundred thousand of this number to the schools in North Carolina. State Congress officials have for some time been directing attention to the fundamental fact that a school bus system cannot be judged exclusively in terms of what it costs to transport each pupil per mile of the necessary distance. They have launched general educational campaigns among their members and the general public to direct attention to the need for efficient transportation of school children in order that the maximum degree of health, safety and protection may be given them while en route to school. The Washington Congress has encouraged special studies of bus equipment and drivers. A definite procedure has been developed. A vehicle inspection blank was prepared and recommended to the state superintendent of public instruction and the state highway patrols, the former because the program affected school children, the latter because bus inspections are made upon request of local school superintendents or trustees by members of the patrol. After approaching the problem, from the top in this manner, Congress officials then approached it from the bottom through encouraging local units to request that these inspections be made. The Georgia and Arizona Congresses of Parents and Teachers has more recently launched an educational campaign for better school buses.

Home safety activities have been very generally undertaken by local parent-teacher associations throughout the country. The state congresses in Iowa, Illinois, Missouri, New Jersey, Ohio, Pennsylvania, South Dakota and the District of Columbia participated in the survey of home injuries conducted by the National Safety Council. All injuries occurring within members' homes during the month covered by the survey were reported in detail. Special monthly bulletins dealing with specific home hazards have been issued in

Wisconsin and presented to the members. California and New Jersey have had countless very lively local association meetings built around true and false or multiple choice tests on home safety.

The radio has been very widely used by national, state and local safety chairmen. Safety broadcasts have had a double purpose—to educate the Congress membership and to educate the general public. The radio has been used in the safety work of the state organizations in South Carolina, Wisconsin, Washington, California, Georgia, Oregon, Ohio, Alabama, Arizona, the District of Columbia and Delaware. An outstanding piece of work was done in Connecticut through the presentation of a series of six safety papers from two stations. These twelve presentations not only covered that state effectively but reached quite generally throughout the whole New England area.

Several attempts to secure safety legislation have been launched. Illinois, Florida, Georgia, Minnesota, Ohio, Iowa, and South Carolina parent-teacher association leaders have been actively engaged in developing an informed membership on the values of the uniform motor vehicle code, particularly that section of it providing for the licensing of drivers. Speeches were made and literature was distributed. Congress officials took their places with the representatives of other community organizations on publicity, steering and other committees. Tennessee was active in a successful attempt to pass a law requiring the teaching of street and highway safety in the public schools. Iowa worked for legislation to prevent the indiscriminate use of fireworks and North Carolina launched an educational campaign on the same problem.

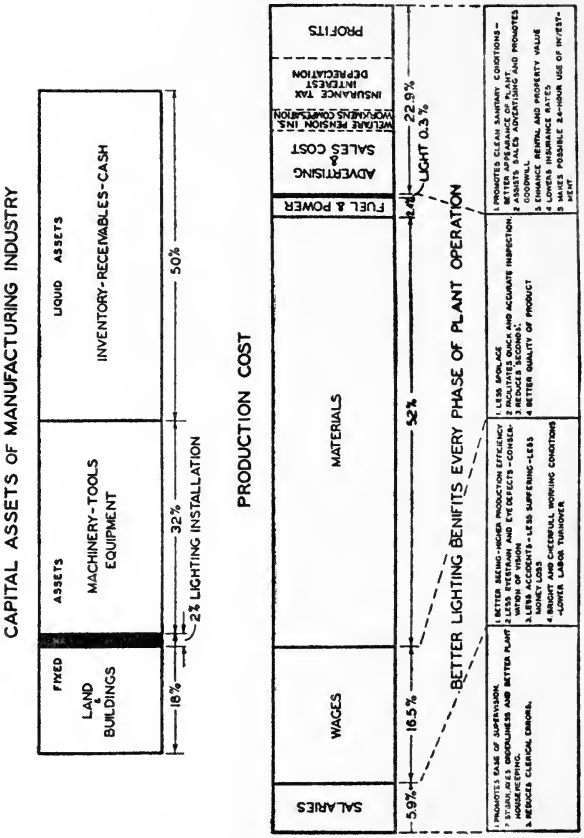
School boy patrols have been sponsored by many groups; 132 local parent-teacher associations in Illinois alone report that they provided standard equipment for patrols. Recently progress is being made in the drive to organize motor traffic clubs in high schools, or for some other means through

which young motorists may be trained. New York, Minnesota, Nebraska and Texas are being quite successful in initiating this part of the program. As might be expected, this activity is one that has a real appeal for the father members of parent-teacher associations.

Many special projects are reported during the course of every year. The Kentucky Congress recently completed a safety essay and poster contest. The safety chairman in New Hampshire has been sending special material to the parents of new born babes to make sure that the pre-school child will be adequately protected by his parents. Several Maine associations have found it necessary to provide fences for school playgrounds. The Texas Congress has an unusually well-directed and complete fire-prevention program. Rhode Island has for a consistent period of years made arrangements for home safety meetings. Oregon is now concentrating on home safety and safety while at school. Specific material on these two subjects is being made available to every association in the state,

NOTE: Over a million and a half parents and teachers are members of the National Congress of Parents & Teachers. They are directly affiliated with nearly 20,000 local units in 47 states, Hawaii and the District of Columbia.

APPENDIX V


CAPITAL ASSETS OF MANUFACTURING INDUSTRY
FIXED
LAND & BUILDINGS
ASSETS
MACHINERY-TOOLS EQUIPMENT
LIQUID ASSETS
INVENTORY-RECEIVABLES-CASH
18%
32%
50%
2% LIGHTING INSTALLATION
PRODUCTION COST
SALARIES
WAGES
MATERIALS
FUEL & POWER
ADVERTISING & SALES COST
WELFARE PENSION INS. WORKMENS COMPENSATION
INSURANCE TAX INTEREST DEPRECIATION
PROFITS
5.9%
16.5%
52%
2.4%
22.9%
LIGHT 0.3%
BETTER LIGHTING BENIFITS EVERY PHASE OF PLANT OPERATION
1 PROMOTES EASE OF SUPERVISION.
2 STIMULATES GOODLINESS AND BETTER PLANT HOUSEKEEPING.
3. REDUCES CLERICAL ERRORS.
1 BETTER SEEING-HIGHER PRODUCTION EFFICIENCY
2 LESS EYESTRAIN AND EYEDEFECTS-CONSERVATION OF VISION
3. LESS ACCIDENTS-LESS SUFFERING-LESS MONEY LOSS
4 BRIGHT AND CHEERFULL WORKING CONDITIONS -LOWER LABOR TURNOVER
1 LESS SPOILAGE
2 FACILITATES QUICK AND ACCURATE INSPECTION.
3 REDUCES SECONDS.
4 BETTER QUALITY OF PRODUCT
1 PROMOTES CLEAN SANITARY CONDITIONS-BETTER APPEARANCE OF PLANT.
2 ASSISTS SALES ADVERTISING AND PROMOTES GOODWILL
3 ENHANCE RENTAL AND PROPERTY VALUE
4 LOWERS INSURANCE RATES
5 MAKES POSSIBLE 24-HOUR USE OF INVESTMENT